



## **CITY OF MERCER ISLAND**

### **ADVERTISEMENT FOR BIDS**

**2026-AFB-016**

### **LUTHER BURBANK PARK WATERFRONT IMPROVEMENTS**

RELEASE DATE: June 2, 2026

RESPONSE DEADLINE: June 30, 2026, 1:00 pm

Please refer to the project timeline in this document for all important deadlines.

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**DIVISION 00**

**BIDDING, CONTRACT, AND CONDITIONS**

**00 00 01 COVER PAGE**

## 00 11 16 INVITATION TO BID FORM

**PROJECT NAME:** Luther Burbank Park Waterfront Improvements

**BID NUMBER:** 2026-AFB-016

**ENGINEERS ESTIMATE:** \$7,000,000

**LOW RESPONSIBLE BIDDER :** It is the intent of the Owner to award a contract to the low responsible Bidder. The Bidder must meet the Eligibility to Bid requirements outlined in **00 21 13 - [INSTRUCTIONS TO BIDDERS](#)**.

**INVITATION :** Your firm is invited to Bid on the Luther Burbank Park Waterfront Improvements ("Project") for the City of Mercer Island Public Works Department. The project is located at 2048 84th Avenue SE, Mercer Island, WA 98040. Electronically sealed Bids shall be submitted through the Procurement Portal at <https://procurement.opengov.com/portal/mercerislandwa>.

Sealed bids must be received electronically by the City no later than 1:00 pm on Tuesday, June 30, 2026. Contractors are responsible for allowing sufficient time for electronic transmission to ensure timely receipt. Late submittals will not be accepted. There will be no public bid opening. Bid results will be posted on the Procurement Portal.

### PROJECT DESCRIPTION:

Demolition of existing overwater concrete pier structures and removal of creosote-treated timber piles; waterfront plaza soil remediation; and construction of plaza improvements such as rock terraces, ADA-accessible routes, upgraded pavement surfaces, and landscaping. In-water work includes driving small- and large-diameter steel piles; delegated engineering design, manufacturing, and installation of a floating concrete wave attenuator and mooring float; delegated engineering design, manufacturing, and installation of a low-freeboard, floating special purpose dock for non-motorized personal watercraft; steel fabrication of grated overwater piers and gangway abutments supported by steel piles; placement of aluminum ADA compliant gangways to provide float access; nearshore lakebed cleanup; and fiberglass jacketing and grouting of existing creosote-treated timber piles. Additional site work includes construction of fire protection standpipes with associated trenching; trenching for electrical service improvements; irrigation improvements; and improvements to beach access.

The work to be performed includes furnishing all labor, permits, materials, and equipment necessary for the construction of the project, related appurtenances, and performing all work as required by the contract in accordance with the Contract Drawings, Technical Specifications and General Provisions, Instructions to Bidders, and all contents of the Project Manual, all of which are made a part hereof. The estimated Construction Cost for the Project is \$7,000,000.

**PRE-BID PROPOSAL QUESTIONS:** Contractor questions are to be submitted through the Procurement Portal. The City will receive questions until 5:00 pm on Friday, June 19, 2026. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be posted on the Procurement Portal no later than Thursday, June 25, 2026. Failure of any Bidder to receive such addenda or interpretation shall not relieve the Bidder of any obligation under its Bid Proposal as submitted. All addenda or interpretations so issued become part of the Contract Documents.

**REJECTION OF BID:** The City of Mercer Island reserves the right to reject any and all Bid Proposals, and to waive irregularities in the Bid Proposal or in the pricing. No Bidder may withdraw its Bid Proposal after the Proposal deadline, or before award of contract, unless the award is delayed for a period exceeding **sixty (60) calendar days**.

**TIME OF COMPLETION:** The successful Bidder will be required to fully complete all work in all respects within three hundred (300) calendar days from the date written in the notice to proceed.

**PREVAILING RATE OF WAGE:** Pursuant to RCW 39.12, no worker, laborer or mechanic employed in the performance of any part of this contract shall be paid less than the “prevailing rate of wage” (in effect as of the date the Bids are due) as determined by the Department Labor & Industries. Current Prevailing Wage Rates are also available at the Department of Labor & Industries’ website.

**STATE APPROVED APPRENTICESHIP PROGRAM:** This project is subject to RCW 39.04.320 and requires 15% of all labor hours to be performed by apprentices registered in a State Approved Apprenticeship Program. An Apprentice Utilization Plan is required to be submitted. Good Faith Efforts may be considered, and a reduction or waiver may be granted. An incentive will be paid to those that meet the requirement. A penalty will be assessed if the required Apprentice Utilization Plan is not obtained, and no Good Faith Effort has been approved. See Bidding Documents and Contract Documents for additional information including incentive and penalty amounts. Bidders may contact the Department of Labor & Industries, Apprenticeship Section, to obtain information on available apprenticeship programs.

**EQUAL OPPORTUNITY:** The City of Mercer Island is an Equal Opportunity Employer and encourages women, minorities, and City of Mercer Island businesses that are qualified to perform the work to submit a Bid on this project or to offer their services as a supplier or subcontractor.

**TITLE VI:** The City of Mercer Island, in accordance with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42 U.S.C. 2000d to 2000d-4 and Title 49, Code of Federal Regulations, Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally-assisted programs of the Department of Transportation issued pursuant to such Act, hereby notifies all bidders that it will affirmatively ensure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises as defined at 49 CFR Part 23 will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, national origin, or sex in consideration for an award.

**PUBLISHED:** Seattle Daily Journal of Commerce

**DATES:** June 2, 2026, and June 9, 2026

**END OF SECTION**

**00 11 53 RESPONSIBLE BIDDER CRITERIA**

A. Related Documents:

1. [00 21 13 INSTRUCTIONS TO BIDDERS](#)

B. Summary

1. The Responsible Bidder Criteria Form is required to be completed and submitted with the bid.
  - a. Refer to [00 43 00 REQUIRED BID DOCUMENTS – Responsible Bidder Criteria](#).
2. This form is used to determine whether a bidder meets the minimum requirements to be considered a “responsible bidder” in accordance with RCW 39.04.010 and RCW 39.04.350. Bidders must provide accurate, complete, and verifiable information demonstrating compliance with applicable state laws and City requirements.

**END OF SECTION**

## **00 21 13 INSTRUCTIONS TO BIDDERS**

### **PART 1 GENERAL**

#### **1.01 SUMMARY AND DEFINITIONS**

- A. Owner (City): City of Mercer Island

#### **1.02 SUPPLEMENTAL INFORMATION**

- A. Addenda will be available through the Procurement Portal.

#### **1.03 ELIGIBILITY TO BID**

- A. It is the intent of the City to award a contract to the low responsible bidder. Before award, the bidder must meet the following bidder responsibility criteria to be considered a responsible bidder. To be eligible to bid, each Bidder must, at the time of the bid submittal:
1. Have a current certificate of registration as a contractor in compliance with chapter 18.27 RCW; and
  2. Have a current Washington Unified Business Identifier (UBI) number; and
  3. If applicable:
    - a. Have Industrial Insurance (workers' compensation) coverage for the bidder's employees working in Washington, as required in Title 51 RCW; and
    - b. Have a Washington Employment Security Department number, as required in Title 50 RCW; and
    - c. Have a Washington Department of Revenue state excise tax registration number, as required in Title 82 RCW; and
    - d. Have an electrical contractor license, if required by Chapter 19.28 RCW; and
    - e. Have an elevator contractor license, if required by Chapter 70.87 RCW; and
  4. Not be disqualified from bidding on any public works contract under RCW 39.06.010, 39.12.050, RCW 39.12.055, or 39.12.065 (3); and
  5. Not be disqualified or debarred or ineligible to be awarded contracts for which Federal funds have been requested or received.
  6. Completed the L&I online training or meet the prior experience requirements in RCW 39.04.350(1)(f); 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. A contract shall only be awarded to a Bidder that demonstrates to the City's satisfaction that the Bidder is qualified to perform the Work and is, therefore, a responsible bidder.

#### **1.04 SUBCONTRACTOR RESPONSIBILITY CRITERIA**

- A. The Bidder must verify responsibility criteria for each first-tier subcontractor, and each subcontractor of any tier that hires other subcontractors must verify responsibility criteria for each of its subcontractors.
- B. Upon request of the City the Bidder shall promptly provide documentation to the City demonstrating that the subcontractor(s) meets the subcontractor responsibility criteria below. The requirements of this section apply to all subcontractors regardless of tier.
- C. At the time of subcontract execution, the Bidder shall verify that each of its first-tier subcontractors meets the following bidder responsibility criteria:
  - 1. Have a current certificate of registration in compliance with chapter 18.27 RCW; and
  - 2. Have a current Washington Unified Business Identifier (UBI) number; and
  - 3. If applicable:
    - a. Have Industrial Insurance (workers' compensation) coverage for the subcontractor's employees working in Washington, as required in Title 51 RCW; and
    - b. Have a Washington Employment Security Department number, as required in Title 50 RCW; and
    - c. Have a Washington Department of Revenue state excise tax registration number as required in Title 82 RCW; and
    - d. Have an electrical contractor license, if required by Chapter 19.28 RCW; and
    - e. Have an elevator contractor license, if required by Chapter 70.87 RCW; and
    - f. Not be disqualified from bidding on any public works contract under RCW 39.06.010, RCW 39.12.050, RCW 39.12.055, or RCW 39.12.065 (3); and
    - g. Not be disqualified or debarred or ineligible to be awarded contracts for which Federal funds have been requested or received.
    - h. Completed the L&I online training or meet the prior experience requirements in RCW 39.04.350(1)(f); and
    - i. 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.
  - 4. Key personnel must hold an appropriate license in the applicable discipline.

#### **1.05 EXAMINATION OF PLANS, SPECIFICATIONS AND SITE**

- A. Each bidder is instructed to examine the Plans, Specifications, Addenda, the site of the proposed improvements, and conduct any other examination and investigation which the bidder may desire to make as to the accuracy of the nature of the work and the difficulties to be encountered. The Bidder shall be responsible for all costs associated with these additional examinations including all restoration work and damages which may be a result of such investigation. Bidders shall consider Federal, State, and local laws and regulations that may affect cost, progress, or performance of the work.

#### **1.06 ADDITIONAL INFORMATION**



- A. All questions regarding the meaning or intent of the Contract Documents must be submitted through the Procurement Portal. No telephone or oral questions will be accepted or considered. Bidders should reference the applicable specification section, paragraph number, and/or drawing number when submitting questions.
- B. The City will accept questions until Friday, June 19, 2026, at 5:00 pm. Questions received after this deadline will not be answered. All responses will be posted through the Procurement Portal by Thursday, June 25, 2026, at 5:00 pm.
- C. Interpretations or clarifications the City deems necessary will be issued as formal written Addenda, posted through the Procurement Portal. Only information provided in formal written Addenda will be binding. Oral or informal communications will have no legal effect.

#### **1.07 WAGES**

- A. This Contract is subject to Chapters 39.12 and 49.28 RCW, amendments thereto and regulations issued thereunder, relating to prevailing wages, benefits and other requirements. Bidders shall examine and be familiar with such requirements. No claim for additional compensation will be allowed which is based upon a lack of knowledge or a misunderstanding of any such requirements by the Bidder or a failure to include in Bidder's price adequate increases in such wages during the performance of this Contract. A copy of the most recent prevailing wage schedule is in the Appendix of the specifications. Current prevailing wage rates for King County can be obtained from the Washington State Department of Labor and Industries at <https://lni.wa.gov/licensing-permits/public-works-projects/prevailing-wage-rates/>.
- B. If this Contract is for a project that receives Federal funds, the labor and wage and benefits standards in 29 CFR part 5 may also apply, so Bidders shall examine and be familiar with such requirements.

#### **1.08 PROGRESS AND COMPLETION**

- A. Time is of the essence for this Project. Progress and completion of the Work shall comply with all requirements herein, and intermediate and final completion dates as may be set forth in the specifications. The submission of a bid constitutes the Bidder's acknowledgement that such progress and completion requirements have been taken into account in formulating a price for this Work.

#### **1.09 PREVENTION OF ENVIRONMENTAL POLLUTION AND PRESERVATION OF PUBLIC NATURAL RESOURCES**

- A. If awarded the Contract, the Bidder shall fully comply with all such environmental protection laws, ordinances and regulations dealing with prevention and environmental pollution and the preservation of public natural resources that may be applicable to this Project. The cost of such compliance shall be included in the bid prices.

#### **1.10 BID FORM**

- A. The Bid Form is included in the Contract Documents. Bids that contain omissions, erasures or irregularities of any kind may be rejected. Any qualification, addition, limitation or provision attached to or contained in a bid may render the bid non-responsive and not eligible for award. No oral, facsimile, telegraphic or telephonic bids or modifications will be considered.
- B. All bids shall be signed by the Bidder, or the Bidder's authorized representative. If the bid is made:
  - 1. By an individual, the Bidder's name, signature, and address must be shown;

2. By a partnership or joint venture, it shall contain the names of each partner, the mailing address of the partnership or joint venture and shall be signed in the firm name, followed by the signature of the person signing, indicating that person's position in the partnership or joint venture;
  3. By a corporation or limited liability company ("LLC"), the name of the state under the laws of which the corporation or LLC is chartered, the name and post office address of the corporation or LLC and the title of the person who signs on behalf of the corporation or LLC must be shown.
- C. Upon the City's request, the Bidder shall provide copies of the articles of incorporation, bylaws, resolutions of board of directors, partnership papers, joint venture agreements, and any other documents evidencing the legal status of the Bidder and the authority of the Bidder's officer or representative who signed the bid on behalf of the Bidder.
- D. The City is not responsible for any cost incurred in responding to this Call for Bids.

#### **1.11 MANDATORY PRE-BID MEETING**

- A. A Mandatory Pre-Bid Meeting/Walk Through is scheduled on Wednesday, June 17, 2026 at 12:00 pm. Meet at 2048 84th Avenue SE, Mercer Island, WA 98040. The City, at its sole discretion, may schedule an additional pre-bid meeting/walk through. If interested, contact Sarah Bluvas Capital Project Manager, at sarah.bluvas@mercerisland.gov.
- B. Attendance at the Pre-Bid Meeting/Walk Through is mandatory for prime bidders and highly recommended for subcontractors. There will be a sign-in sheet, and the prime bidder will need to acknowledge their attendance on the Bid Form. Bids from entities not represented at the Pre-Bid will not be considered for contract award.
- C. During the pre-bid meeting/walk through, all conversations are considered informal and are not contractually binding unless stated in the contract bid package, contract drawings, or modified by a written addendum. The order of precedence is written addendum, contract drawings, and lastly contract specifications.

#### **1.12 ACKNOWLEDGEMENT OF ADDENDA**

- A. The Bidder shall acknowledge receipt of each Addendum issued through the Procurement Portal by the City during the bidding period. If the Bidder does not specifically acknowledge each addendum, the City may reject the bid as non-responsive unless the City determines from delivery records or from inclusion of information in the bid of information contained in the addenda that the Bidder received constructive notice of the addenda.

#### **1.13 BID SECURITY**

- A. The Bid shall be accompanied by a bid deposit in the amount equal to at least 5% of the Total Bid Price. The bid deposit shall be in one of the following formats and made payable to the City:
1. A bid guaranty bond, in accordance with and using a form acceptable to the City which contains provisions substantially similar to those in the bid bond form included with the Contract Documents, duly completed by a guaranty company authorized to carry on business in the state of Washington; or
  2. A postal money order, a certified check, or cashier's check drawn upon a banking institution with a branch office in the state of Washington. For bid guarantees submitted in either of these forms, the original must be received by Sarah Bluvas at 9611 SE 36th Street, Mercer Island, WA 98040 by Tuesday, June 30, 2026, at 1:00 pm.
- B. The surety signing the bid guaranty bond shall be registered with the Washington State Insurance Commissioner, and the surety's name shall appear in the current Authorized Insurance Company List in the State of Washington

published by the Office of the Insurance Commissioner. A Power of Attorney must accompany the bid guaranty bond and must appoint the surety's true and lawful attorney-in-fact to make, execute, seal and deliver the bid guarantee bond. Failure to submit the required bid security with the Bid shall render the bid non-responsive and the Bid shall be rejected.

#### **1.14 NON-COLLUSION**

- A. Each bid shall be accompanied by a signed Non-Collusion Declaration in accordance with, and using the form provided by the City. Failure to submit a signed Declaration with the Bid shall render the bid non-responsive and the Bid shall be rejected.
- B. More than one Bid from an individual, firm, partnership, corporation, or association under the same or different names will not be considered. If the City believes that any Bidder is interested in more than one Bid for the work contemplated, all Bids in which such Bidder is interested will be rejected. If the City believes that collusion exists among the Bidders, all Bids will be rejected.

#### **1.15 DELIVERY OF BID**

- A. Each Bid shall be submitted through the Procurement Portal. The City will not consider bids received after the time fixed for opening bids in the Advertisement for Bids. A Bid is deemed submitted as evidenced by the receipt date and time shown in the source code of the email received by the City's computer system. Contractors accept all risk of late delivery, regardless of fault. Any submittal received after the due date and time shall be deemed non-responsive and will eliminate their Bid from any further consideration. All respondents will receive an email confirmation within the next business day indicating their submittal has been successfully received.
- B. The submission of a Bid will constitute an incontrovertible representation by the Bidder that the Bidder has complied with every requirement of these instructions, that without exception the Bid is premised upon performing the work required by the Contract Documents and such means, methods, techniques, sequences, or procedures of construction as may be indicated in or required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance of the work.

#### **1.16 MODIFICATION OF BID**

- A. A modification of a Bid will be considered only if the modification is received prior to the time announced for the opening of Bids. All modifications shall be made in writing executed and submitted in the same form and manner as the original Bid.

#### **1.17 RETURN OF BID SECURITY**

- A. After the bid prices have been compared, the City may return the bid security if, in the City's judgment, the Bidder would not be considered for award. All other Proposal Guarantees will be held until the Contract and the Performance Bond of the successful bidder have been executed.

#### **1.18 EVALUATION OF BIDS AND BID ERROR**

- A. After opening the Bids, the City will check them for correctness of extensions of the prices per unit and the total price. If a discrepancy exists between the price per unit and the extended amount of any bid item, the price per unit will control. The total of extensions, corrected where necessary, will be used by the City for award purposes.
- B. Irregular Bids:

1. A Bid will be considered irregular and will be rejected if:
  - a. The authorized Bid Form furnished by the City is not used or is materially altered;
  - b. The completed Bid Form contains any unauthorized additions, deletions, alternate bids, or conditions;
  - c. The bidder adds provisions reserving the right to reject or accept the Award, or enter into the Contract;
  - d. A price per unit cannot be determined from the Bid Form;
  - e. The Bid Form is not properly executed;
  - f. An executed non-collusion certificate is not provided; or
  - g. Proper bid security does not accompany the Bid.
2. A Bid may be considered irregular and may be rejected if:
  - a. The Bid Form does not include a unit price for every Bid item;
  - b. Any of the unit prices are excessively unbalanced (either above or below the amount of a reasonable Bid) to the potential detriment of the City;
  - c. Receipt of Addenda is not acknowledged;
  - d. A member of a joint venture or partnership and the joint venture or partnership submit Bid Forms for the same project (in such an instance, both Bids may be rejected); or
  - e. If Bid Form entries are not made in ink.
- C. Bids will be evaluated by the City to determine which bid is the apparent lowest, responsive bid.
- D. Bid results will be posted on the Procurement Portal.
- E. The City, in its sole discretion, reserves the right to waive minor bid errors, informalities, and immaterial irregularities when it is in the City's best interest to do so.

#### **1.19 EVALUATION OF BIDDER RESPONSIBILITY**

- A. A Contract shall only be awarded to a Bidder that demonstrates to the City's satisfaction that the Bidder is qualified to perform the Work and is, therefore, a responsible bidder.
- B. Bidder Responsibility Criteria. To be determined responsible, the Bidder must, in addition to satisfying the bidder responsibility criteria listed in Section 1. ELIGIBILITY TO BID above:
  1. Have adequate financial resources to perform the contract, or the ability to obtain them;
  2. Have a satisfactory performance record;
  3. Have a satisfactory record of integrity and business ethics;
  4. Have the necessary production, construction, and technical equipment and facilities or the ability to obtain them;
  5. Be otherwise qualified and eligible to receive an award under applicable laws and regulations;
  6. Be in compliance with training requirements in RCW 39.04.350(1)(f); and

7. Provide a statement in accordance with RCW 9A.72.085 verifying compliance with responsible bidder criteria requirement of RCW 39.04.350(1)(g).
- C. Reference Checking. To assist the City in the review of the Bidder's qualifications, the Bidder shall, within five (5) days of being requested to do so by the City, provide the following information:
  1. Past Experience in Similar Projects. Provide a list of all construction contracts (whether completed or in progress) entered into or performed by the Bidder within the past five (5) years for projects similar in scope, time and complexity to the work called for under this Contract. Provide the names of the contracts, the total contract price, the name of the foreman, the foreman's previous project experience as a foreman on 3 similar construction contracts, and the names and phone numbers of the owners.
  2. References. Provide a list of five (5) references. References will be asked to rate performance on the following items: overall impression of the company; firm experience and technical knowledge; foreman experience and quality of work, effective coordination of subcontractors; ability to coordinate and work with utility companies and governmental entities; responsiveness to owner requests; attention to safety; quality and timeliness of submittals, change order proposals, project schedule, schedule updates and other applicable paperwork.
- D. If the Bidder is a joint venture, the Bidder shall submit information for the joint venture if the members have worked together in the past and also information about each member of the joint venture. The Joint Venture Agreement shall be included in the submission.
- E. If the Bidder fails to supply information requested concerning responsibility within the time and the manner specified, the City may base its determination of responsibility upon any available information related to the responsibility criteria or may find the Bidder is not responsible.
- F. The City reserves the right to inspect records, reports and other information which may be maintained by or for the Bidder to the extent necessary, as determined by the City to verify, clarify or otherwise consider the information provided by the Bidder.

#### **1.20 DETERMINATION OF NON-RESPONSIBILITY**

- A. If the City determines a Bidder to be not responsible, the City will provide, in writing, the reasons for the determination. The Bidder may appeal the determination within ten (10) days of its receipt of the City's determination of non-responsibility by presenting additional information to the City. The City shall consider the additional information before issuing its final determination. If the City's final determination affirms that the Bidder is not responsible, the City shall not execute a contract with any other bidder until two (2) business days after the Bidder determined to be not responsible has received the final determination.

#### **1.21 CONTRACT AWARD**

- A. If a Contract is awarded, the City will award the contract to the responsible bidder that submits the lowest total responsive bid for the schedule(s) selected by City after bid opening and prior to award.
- B. If the Contract is to be awarded, City will give the successful Bidder a Notice of Award within sixty (60) days after the day of the Bid opening. No other act of the City or others will constitute acceptance of a Bid.
- C. The City reserves the right to request bidders to extend the effective period of their bids.

#### **1.22 REJECTION OF ALL BIDS**

- A. The City reserves the right to reject any or all Bids at any time up to actual execution of the Public Works Contract, even if there has been an award of the Contract.
- B. Any or all Bids will be rejected if the City has reason to believe that collusion exists among the Bidders.

#### **1.22 EXECUTION OF PUBLIC WORKS CONTRACT**

- A. The Bidder to whom award is made shall execute a written Public Works Contract with the City on the form provided, including any Addenda and any other Exhibits attached thereto, shall secure all insurance, and shall furnish all certificates, endorsements and bonds required by the Contract Documents within ten (10) calendar days after receipt of the forms from the City. Failure or refusal to execute the Public Works Contract, including any Addenda and any other Exhibits attached thereto, as herein provided or to conform to any of the stipulated requirements in connection therewith shall be just cause for annulment of the award and forfeiture of the Bid security. If the lowest responsive, responsible Bidder refuses or fails to execute the Public Works Contract, including any Addenda and any other Exhibits attached thereto, the City may award the Contract to the second lowest responsive, responsible Bidder. If the second lowest responsive, responsible Bidder refuses or fails to execute the Public Works Contract, including any Addenda and any other Exhibits attached thereto, the City may award the contract to the third lowest responsive, responsible Bidder. On the failure or refusal of such second or third lowest Bidder to execute the Agreement, including any Addenda and any other Exhibits attached thereto, each such Bidder's Bid securities shall be likewise forfeited to the City.

#### **1.23 BID PROTEST PROCEDURES**

- A. Form of Protest. In order to be considered, a Protest shall be in writing, addressed and delivered to the attention of the project manager at the City of Mercer Island, 9601 SE 36th Street, Mercer Island, Washington 98040. The Protest shall include the following:
  - 1. The name, address, and phone number of the Bidder protesting, or the authorized representative of the Bidder;
  - 2. A complete, detailed statement of all grounds for protest, supporting authority, and any supporting documentation. Supplemental information will not be considered unless the supplementation contains information not available at the time of protest;
  - 3. The specific ruling or relief requested; and
  - 4. Evidence that all persons with a financial interest in the procurement have been given notice of the Protest or if such persons are unknown, a statement to that effect.
- B. Who May Protest
  - 1. Protests based on specifications: Any prospective Bidder.
  - 2. Protests following Bid opening: Any Bidder with a substantial financial interest in the award of a Contract.
- C. Time to Protest:
  - 1. Protests based on specifications or other terms in the Contract Documents must be received by the City no later than ten (10) calendar days prior to the date established for submittal of Bids.
  - 2. The City must receive protests based on other circumstances within five (5) calendar days after the bids are opened and publicly read.

3. In no event shall a Protest be considered if all bids are rejected or after execution of the Contract.
- D. Determination of Protest. Upon receipt of a timely written Protest, the City shall investigate the Protest and shall respond in writing to the Protest prior to the award of Contract. If protest is submitted in accordance with the procedures set forth above, the City will not execute a contract any sooner than two (2) business days after the City's decision on the Protest.
- E. Failure to Comply. Failure to comply with the procedures set forth herein may render a Protest untimely or inadequate and may result in rejection thereof by the City.
- F. Exhaustion of Administrative Remedies. By submitting a bid, the Bidder agrees the Bidder's compliance with the protest procedures set forth herein are a mandatory condition precedent to the Bidder initiating a lawsuit against the City.
- G. Venue. By submitting a bid, the Bidder acknowledges and agrees that a lawsuit or action related to or arising out of this procurement shall be brought in the Superior Court of King County, Washington.

## **PART 2 PRODUCTS**

(NOT USED)

## **PART 3 EXECUTION**

(NOT USED)

**END OF SECTION**

**00 24 00 PROCUREMENT SCOPE OF WORK**

**1.01 SUMMARY OF WORK**

- A. The Base Bid work shall include those work items generally related to all work required to complete the construction of the Project including, but not be limited to, the following:
1. Site clearing and removal of existing conditions;
  2. Demolition of existing overwater concrete piers, timber pile caps, and extraction and disposal of creosote-treated timber piles
  3. Trenching, below-grade repairs, improvements, and new infrastructure;
  4. New utility connections;
  5. Site grading;
  6. Soil containment;
  7. Coordination with specialty contractors;
  8. Engineered design and construction of a concrete wave attenuator and mooring float;
  9. Engineered design and construction of a low-freeboard floating special purpose dock including aluminum framed ADA kayak launch;
  10. Engineered design and construction of aluminum gangways;
  11. Steel pile driving;
  12. Steel framing fabrication and erection;
  13. Repair of an existing floating timber-framed dock;
  14. Repair of an existing concrete pier including timber pile cap replacements and fiberglass jacketing with epoxy grout injection of existing creosote-treated timber piles;
  15. Construction of fire protection standpipes with associated trenching;
  16. Trenching for electrical service and communication improvements;
  17. Improved beach access;
  18. New ADA compliant pedestrian connections;
  19. New plantings and irrigation;
  20. Soil clean-up and restoration.



**1.02 BASIS OF AWARD**

- A. A contract will be awarded, if at all, based on the lowest responsible Bidder for the **TOTAL BID PRICE FOR ALL SCHEDULES**.
- B. Refer to [01 22 00 UNIT PRICES](#) for complete descriptions of Unit Prices. Unit Prices are included in the Lump Sum Base Bid total.
- C. Refer to [00 41 13 BID FORM](#).

**1.03 PREVAILING WAGE RATES**

- A. The State of Washington prevailing wage rates for King County apply to work performed under this contract. The applicable prevailing wage rates may be found at the following website address of the Department of Labor and Industries: <https://secure.lni.wa.gov/wagelookup/>
- B. Based on the bid submittal date for this project, the applicable date for prevailing wages for this project is Tuesday, June 30, 2026. A copy of the applicable prevailing wage rates are also available for viewing at the City of Mercer Island, Public Works Building located at 9601 SE 36th Street.

**END OF SECTION**

**00 31 26 ASBESTOS AND LEAD CONTAINING MATERIALS CERTIFICATION FORM**

A. Summary

1. This form requires the Contractor to certify that no materials containing asbestos or lead in excess of legal limits have been incorporated into the Work.
2. The certification must be completed and signed by an authorized representative of the General Contractor upon completion of construction.
3. The Asbestos and Lead Containing Material Certification Form is included as an [ATTACHMENT](#).

**END OF SECTION**

**00 41 13 BID FORM****A. Summary**

1. All rates and pricing submitted shall include all costs associated with performance of the contract, including, but not limited to, wages, benefits, tools, equipment, ancillary supplies, overhead, profit, bonds, and administrative fees. Do not include WSST in each line item, as it is calculated separately automatically.
2. Washington State Prevailing Wage rates for King County shall apply. Contractor, and all subcontractors, must obtain a valid City of Mercer Island Business License.

**BID ITEMS**

Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total
1	Mobilization [*]	1	LS		
2	Shoring and Trench Safety Systems [*]	1	LS		
3	Survey [*]	1	LS		
4	Temporary Erosion and Sediment Control [*]	1	LS		
5	Temporary Water Treatment and Disposal [*]	1	LS		
6	Construction Dewatering [*]	1	LS		
7	Demolition - Boiler Building Plaza [*]	1	LS		
8	Demolition - Utility Trenching [*]	1	LS		
9	Demolition - Cleanup Action Excavation [*]	1	LS		
10	Earthwork - Cleanup Action Excavation [*]	235	TON		
11	Earthwork - Plaza Improvements [*]	1	LS		
12	Soil Disposal - Impacted [*]	235	TON		
13	Soil Disposal - Clean [*]	1,727	TON		

Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total
14	Petrofix [*]	1,200	LB		
15	Crushed Surfacing - Plaza Improvements [*]	14.9	CY		
16	Asphalt Pavement - Plaza Improvements [*]	5.3	TON		
17	Crushed Surfacing - Utility Trenches [*]	7.6	CY		
18	Asphalt Pavement - Utility Trenches [*]	35	TON		
19	Concrete Pavement - Utility Trenches [*]	127	SF		
20	Storm Drainage [*]	1	LS		
21	Silva Cell (Owner Provided) [*]	1	LS		
22	Fire Water - Dock [*]	1	LS		
23	Fire Water - Boiler Building [*]	1	LS		
24	Sanitary Sewer [*]	1	LS		
25	Domestic Water [*]	1	LS		
26	Electrical Service [*]	1	LS		
27	Plaza Light Pole [*]	1	LS		
28	Irrigation Intake System [*]	1	LS		
29	Concrete Pavement [*]	2,936	SF		
30	Permeable Pavers [*]	2,131	SF		
31	Gravel Base and Bedding and Joint Filler for Permeable Pavers [*]	28.11	TON		
32	Polymetric Sand [*]	1,119	SF		

Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total
33	Permeable Paver Border [*]	21	LF		
34	Concrete Thickened Edge [*]	91.5	LF		
35	Habitat Gravel [*]	60.89	TON		
36	Concrete Stairs [*]	160	LF		
37	Handrail at Concrete Stairs and ADA Ramp [*]	254.4	LF		
38	Rock Terraces [*]	1	LS		
39	Gravel Pathway and Driveway [*]	58.65	TON		
40	Boulders [*]	8	EA		
41	Large Woody Debris [*]	5	EA		
42	Site Furnishings and Signs (Owner Provided) [*]	1	LS		
43	Medallions (Owner Provided) [*]	1	LS		
44	Interpretive Sign Bracket (Owner Provided) [*]	1	LS		
45	Irrigation [*]	1	LS		
46	Landscape, incl. Topsoils, Planting, and Plant Maintenance for Plant Establishment through Physical Completion [*]	1	LS		
47	Pier and Dock Demolition [*]	1	LS		
48	Grated Overwater Platform [*]	1	LS		
49	Existing Fixed Pier Repair [*]	1	LS		
50	Fixed Pier Grating [*]	1	LS		

Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total
51	Wave Attenuator/Mooring Float, incl. Finger Floats, 60' x 60' Aluminum Gangway, and Gangway Abutment [*]	1	LS		
52	Floating Special Purpose Dock, incl. Finger Floats, Aluminum Framed ADA Kayak Launch, and 32' x 8' Aluminum Gangway and Gangway Abutment [*]	1	LS		
53	"No Wake" and "Non-Motorized Vessels" Buoys [*]	1	LS		
54	Steel Pipe Pile - 16" x 0.625" (Floating Special Purpose and City Docks) [*]	278	LF		
55	Steel Pipe Pile - 24" x 0.625" (Wave Attenuator/Mooring Float) [*]	1,017	LF		
56	Steel Pipe Pile - 6.625" x 0.375" (Overwater Platform) [*]	122	LF		
57	Steel Pile Driving - 16" x 0.625" (Floating Special Purpose and City Docks) [*]	7	EA		
58	Steel Pile Driving - 24" x 0.625" (Wave Attenuator/Mooring Float) [*]	15	EA		
59	Steel Pile Driving - 6.625" x 0.375" (Overwater Platform) [*]	6	EA		
[*] Denotes item is taxable					
Sales Tax (@ 10.3%)					
<b>TOTAL</b>					

#### ALLOWANCES

Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total
A1	Unforeseen Conditions	1	FA	\$100,000.00	

Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total
A2	Apprenticeship Utilization Requirements	1	FA	\$3,000.00	
A3	Existing Floating Wood Dock Repairs	1	FA	\$90,000.00	
<b>TOTAL</b>					

**00 42 13 PROPOSAL REQUEST FORM****A. Summary**

1. The Proposal Request Form is used by the City to request an itemized proposal from the Contractor for proposed changes to the Contract Sum and/or Contract Time. The Contractor must provide a detailed cost and schedule impact for the described modifications within the specified timeframe.
2. This request is for pricing purposes only and does not constitute a Change Order, Construction Change Directive, or authorization to proceed with the work.
3. The Proposal Request Form is included as an [ATTACHMENT](#).

**END OF SECTION**

**00 43 00 REQUIRED BID DOCUMENTS**

**ALL BIDDERS** must complete, execute, and submit the required items listed below as part of their bid package.

The required items consist of a combination of:

- Bidder acknowledgments and certifications, and
- Forms to be completed and submitted with the bid.

Failure to properly complete, acknowledge, and submit all required items may result in the bid being deemed non-responsive and not considered for award.

**1. Bidder Declaration and Understanding\***

The Undersigned Bidder declares that the only persons or parties interested in this Bid are those named herein, that this Bid is, in all respects, fair and without fraud, that it is made without collusion with any official or representative of the City, and that the Bid is made without any connection or collusion with any person submitting or considering the submission of another Bid on this Contract.

The Bidder further agrees that it has exercised its own judgment regarding the interpretation of subsurface information and has utilized all data which it believes pertinent from the Design Professional, City, and other sources in arriving at its conclusions. The Bidder further declares that it has carefully examined the Contract Documents for the Project, that it has personally inspected the site, that it has satisfied itself as to the quantities involved, including materials and equipment, and conditions of work and the fact that the description of the quantities of work and materials herein is brief and is intended only to indicate the general nature of the Work contained in the detailed requirements of the Contract Documents, and that this Bid is made according to the provisions and under the terms of the Contract Documents, which are hereby made a part of this Bid.

The Undersigned Bidder states that it has the ability and means to complete the Work in a timely manner and proposes to furnish all labor, materials, machinery, tools, and other means of construction, and to perform all work required by and in strict accordance with the Contract Documents for the amounts shown, which **DOES NOT include WA State Sales Tax** (WSST will be added to the contract awarded after Bidding). All other applicable taxes, including Washington State B&O tax and all contractor-incurred taxes, shall be included in the Bid pricing.

☐ Please confirm

\*Response required

**2. Prevailing Wage Rates\***

A. Refer to [INSTRUCTIONS FOR PREVAILING WAGE REQUIREMENTS](#).

B. The Contractor stipulates and agrees that they have reviewed the applicable prevailing wage rate schedule, has contacted the State to verify current rates, and has made appropriate provision in the submitted Bid for payment of all applicable prevailing wage rates.

☐ Please confirm



\*Response required

**3. TIME FOR COMPLETION\***

- A. Construction shall be completed within **three hundred (300) calendar days** from the written Notice to Proceed. If not completed by that date, the Contractor will be liable to the City for damages. The City and Contractor agree that in the event this project is not completed on time, the City's damages are difficult to calculate. As a result, Liquidated Damages will be assessed according to the Contract Documents, for each calendar day that the work is not completed within the specified time of completion.
- B. If the undersigned is notified of the acceptance of this Bid Proposal within sixty (60) calendar days of the Bid deadline, the undersigned agrees to execute a contract for the above work Bid, in the form of the contract bound in these specifications, and to provide a surety bond as required by the specifications.

☐ Please confirm

\*Response required

**4. BID GUARANTEE\***

The undersigned further agrees that the Bid guarantee accompanying this Bid Form (cashier's check, postal money order, or surety bond) shall be left in escrow with the City; that the liquidated damages that the City will sustain by the failure of the undersigned to execute and deliver the above named contract and surety bond, for any or all units of this Bid Proposal accepted by the City, will be in an amount not less than five percent (5%) of the total Bid amount including all Additive Alternates; and that if the undersigned defaults in executing that contract and in furnishing the surety bond within ten (10) calendar days of the award of the contract, at which time the bid guarantee will become the property of the City. If, however, this Bid Proposal or any part thereof is not accepted within ninety (90) calendar days of the Bid deadline, or if the undersigned executes and delivers said contract and surety bond, the bid guarantee must be returned to the Bidder.

For Bid guarantees submitted in the form of a cashier's check or postal money order, the original must be received by Sarah Bluvias at 9611 SE 36th Street, Mercer Island, WA, 98040, by Tuesday, June 30, 2026, at 1:00 pm.

☐ Please confirm

\*Response required

**5. Mandatory Pre-Bid Meeting Attendance\***

Please confirm that the prime bidder attended the mandatory pre-bid meeting scheduled on Wednesday, June 17, 2026 at 12:00 pm at 2048 84th Avenue SE, Mercer Island, WA 98040 and signed the official sign-in sheet, acknowledging that bids from entities not represented at the meeting will not be considered for award.

☐ Please confirm

\*Response required

**6. 00 11 53 Responsible Bidder Criteria Form\***

Please download the below document, complete, and upload.

- [00 11 53 RESPONSIBLE BIDDER...](#)

\*Response required

**7. 00 43 13 Bid Guaranty Bond Form\***

Please download the below document, complete, and upload.

- [00 43 13 BID GUARANTY BOND ...](#)

\*Response required

**8. 00 43 63.01 Proposed Subcontractor Form A\***

Please download the below document, complete, and upload.

- [00 43 63.01 PROPOSED SUBCON...](#)

\*Response required

**9. 00 43 63.02 Proposed Subcontractor Form B\***

Please download the below document, complete, and email to Sarah Bluvas

at [sarah.bluvas@mercerisland.gov](mailto:sarah.bluvas@mercerisland.gov) within 48 hours after the published Bid submittal deadline. Failure of the Bidder to submit the names of subcontractors or to name itself to perform such work, or the naming of two or more subcontractors to perform the same work, will render the Bidder's Bid Proposal nonresponsive and, therefore, void.

- [00 43 63.02 PROPOSED SUBCON...](#)

\*Response required

**10. 00 45 19 Non-Collusion Affidavit Form\***

Please download the below document, complete, and upload.

- [00 45 19 NON-COLLUSION AFFI...](#)

\*Response required

**11. 00 52 14 Contractor Declaration Form\***

Please download the below document, complete, and upload.

- [00 52 14 CONTRACTOR DECLARA...](#)

\*Response required

**12. 00 52 15 Bidder Identification, Signature Sheet, and Declaration Form\***

Please download the below document, complete, and upload.

- [00 52 15 BIDDER IDENTIFICAT...](#)

\*Response required

**13. 00 62 91 Wage Compliance Certification Form\***

Please download the below document, complete, and upload.

- [00 62 91 Wage Compliance Ce...](#)

\*Response required

**14. Do you acknowledge the terms of the Public Works Contract?\***

The contract form to be used is the City's standard Public Works Contract. By submitting a bid proposal, the bidder agrees to the terms and conditions contained in the contract included as an [ATTACHMENT](#). No modifications will be permitted.

☐ Please confirm

\*Response required

**00 43 13 BID GUARANTY BOND FORM**

A. Related Documents

1. [00 21 13 INSTRUCTIONS TO BIDDERS](#)

B. Summary

1. The Bid Guaranty Bond Form is required to be completed and submitted with the bid.
  - a. Refer to [00 43 00 REQUIRED BID DOCUMENTS – Bid Guaranty Bond Form](#).
2. This form is used to provide bid security in an amount equal to at least five percent (5%) of the Total Bid Price and must be executed by a surety authorized to do business in the State of Washington. A Power of Attorney must accompany the bond.
3. Failure to submit the required bid security with the bid will result in the bid being deemed non-responsive and rejected.

**END OF SECTION**

**00 43 25 SUBSTITUTION REQUEST FORM (DURING BIDDING)**

**A. Summary**

1. Contractors requesting a substitution during the bidding process must use the Substitution Request Form included as an [ATTACHMENT](#). Download and complete the form in full prior to submission.
2. Substitution requests must be submitted through the Question and Answer (Q&A) section of the solicitation and received no later than Friday, June 19, 2026 at 5:00 pm. Responses will be provided by the City by Thursday, June 25, 2026 at 5:00 pm.
3. To submit a substitution request:
  - a. Open the solicitation in OpenGov.
  - b. Navigate to Attachments and download the 00 43 25 Substitution Request Form.
  - c. Complete the form.
  - d. Navigate to the Q&A section.
  - e. Upload the completed form.
  - f. Click "Submit Question."

**END OF SECTION**

**00 43 63.01 PROPOSED SUBCONTRACTOR FORM A**

**A. Summary**

1. The Bidder shall submit, at the Bid submittal time, the names of all Subcontractors with which the Bidder will subcontract for performance of the Work for HVAC (heating, ventilation, and air conditioning), plumbing, and electrical, or to name itself for the Work. If there is no Work to be performed for any of these scopes of work, the Bidder should insert "None," or "N/A," on the applicable line item.
  - a. Refer to [00 43 00 REQUIRED BID FORMS – Proposed Subcontractors Form A - HVAC, Plumbing, and Electrical](#).
2. The Bidder may not list more than one (1) entity for each category of work identified.
3. Failure of the Bidder to submit the names of subcontractors or to name itself to perform such work, or the naming of two or more subcontractors to perform the same work, will render the Bidder's Bid Proposal nonresponsive and, therefore, void.
4. The Bidder, if awarded the Contract, will subcontract with the listed subcontractor for performance of the portion of the work designated, subject to the provisions of the Contract and RCW 39.30.060. The Bidder may not substitute a listed subcontractor in furtherance of Bid shopping or Bid peddling.
5. If a listed subcontractor is unable to comply with any requirement of the Contract or the Bidding documents, the Bidder may be required to replace the subcontractor with an acceptable subcontractor.

**END OF SECTION**

**00 43 63.01 PROPOSED SUBCONTRACTOR FORM B**

**A. Summary**

1. The Bidder shall email to Sarah Bluvas at [sarah.bluvas@mercerisland.gov](mailto:sarah.bluvas@mercerisland.gov), within 48 hours after the published Bid submittal time, the names of all Subcontractors with which the Bidder will subcontract for performance of the Work of structural steel installation and rebar installation. If there is no Work to be performed for any of these scopes of work, the Bidder should insert "None," or "N/A," on the applicable line item.
  - a. Refer to [00 43 00 REQUIRED BID FORMS – Proposed Subcontractors Form B - Structural](#)
2. The Bidder may not list more than one (1) entity for each category of work identified.
3. Failure of the Bidder to submit the names of subcontractors or to name itself to perform such work, or the naming of two or more subcontractors to perform the same work, will render the Bidder's Bid Proposal nonresponsive and, therefore, void.
4. The Bidder, if awarded the Contract, will subcontract with the listed subcontractor for performance of the portion of the work designated, subject to the provisions of the Contract and RCW 39.30.060. The Bidder may not substitute a listed subcontractor in furtherance of Bid shopping or Bid peddling.
5. If a listed subcontractor is unable to comply with any requirement of the Contract or the Bidding documents, the Bidder may be required to replace the subcontractor with an acceptable subcontractor.

**END OF SECTION**

**00 43 93 BIDDER CHECKLIST FORM****REQUIRED FORMS**

ALL BIDDERS must properly complete, execute and submit the following [REQUIRED BID DOCUMENTS](#) with their bids:

This checklist is provided for bidder's convenience only and identifies the bid documents that must be submitted with each package. ALL BIDDERS must properly execute and submit the following [REQUIRED BID DOCUMENTS](#) with their bids. Any Bid packages received without these documents may be deemed non-responsive and may not be considered for award.

A. [00 52 15 BIDDER IDENTIFICATION, SIGNATURE SHEET, AND DECLARATION](#)

1. To be completed and signed.

B. [00 11 53 RESPONSIBLE BIDDER CRITERIA](#)

1. To be completed and signed. The City reserves the right to check all statements and to judge the adequacy of the bidder's qualifications.

C. [00 41 13 BID FORM](#)

1. Bidders must bid on all items contained in the Bid Form and the Form must be signed. The omission or deletion of any bid item may render the bid non-responsive and result in the rejection of the bid. Bidders are reminded to comply with RCW 39.30.060.

D. [00 43 13 BID GUARANTY BOND FORM](#)

1. Failure to furnish a bid deposit of a minimum of five percent (5%) shall make the bid non-responsive and not eligible for award. Required bonds may be submitted as a certified check, cashier's check, postal money order, or surety bond.

E. [00 43 63.01 PROPOSED SUBCONTRACTOR FORM A– HVAC, PLUMBING, AND ELECTRICAL](#)

1. At the Bid submittal time, Bidder shall submit either itself or the names of the subcontractors with whom the Bidder, will subcontract for performance of the work of heating, ventilation, and air conditioning ("HVAC"), plumbing, and electrical, or to name itself for the work. Identify any subcontractors completing more than 10% of the work.

F. [00 43 63.02 PROPOSED SUBCONTRACTOR FORM B– STRUCTURAL](#)

1. Within 48 hours after the published Bid submittal time, Bidder shall submit either itself or the names of the subcontractors with whom the Bidder, will subcontract for performance of the work of structural steel and rebar installation, or to name itself for the work. Identify any subcontractors completing more than 10% of the work.

G. [00 45 19 NON-COLLUSION AFFIDAVIT FORM](#) (SIGNED AND NOTARIZED)

1. Failure to submit the certificate shall make the bid non-responsive and not eligible for award.

H. [00 52 14 CONTRACTOR DECLARATION FORM](#) PURSUANT TO RCW 39.04.350(2)

1. Failure to submit the declaration shall make the bid non-responsive and not eligible for award

To assist the City in the review of the responsible Bidder's qualifications, the Bidder(s) shall, within five (5) days of being requested to do so by the City, provide the information required in Evaluation of Bidder Responsibility of the [INSTRUCTIONS TO BIDDERS](#) in accordance with RCW 9A.72.085 verifying compliance with responsible bidder criteria requirement of RCW 39.04.350(1)(g).

The **SUCCESSFUL BIDDER** shall properly complete, execute (as required), and submit the following documents after receiving the Notice of Award for the Project. Refer to the forms provided as [ATTACHMENTS](#).

- A. [00 31 26 ASBESTOS AND LEAD CONTAINING MATERIALS CERTIFICATION FORM](#)
- B. [00 52 13 CONTRACT AGREEMENT](#)
- C. [00 61 16 PAYMENT BOND FORM](#)
- D. [00 61 19 PERFORMANCE BOND FORM](#)
- E. [00 61 23 RETAINAGE ELECTION FORM](#)
- F. [00 62 91 WAGE COMPLIANCE CERTIFICATION FORM](#)
- G. Certificate of Insurance
- H. Statement of Intent to Pay Prevailing Wages
- I. [APPENTICE UTILIZATION PLAN DOCUMENTS](#)
- J. Other documents requested by City

This checklist is provided for bidder's convenience only and identifies the bid documents that must be submitted with each package. Any Bid packages received without these documents may be deemed non-responsive and may not be considered for award.

**END OF SECTION**



**00 45 19 NON-COLLUSION AFFIDAVIT FORM**

A. Related Documents:

1. [00 21 13 INSTRUCTIONS TO BIDDERS](#)

B. Summary

1. The Non-Collusion Affidavit Form is required to be completed, signed, and submitted with the bid.
  - a. Refer to [00 43 00 REQUIRED BID DOCUMENTS – Non-Collusion Affidavit Form](#).
2. This form certifies that the bid is made independently and without collusion. Submission of more than one bid by the same entity, or evidence of collusion among bidders, may result in rejection of all associated bids.
3. Failure to submit a signed Non-Collusion Affidavit Form will result in the bid being deemed non-responsive and rejected.

**END OF SECTION**

**00 52 13 CONTRACT AGREEMENT**

A. Related Documents:

1. [00 21 13 INSTRUCTIONS TO BIDDERS](#)

B. Summary

1. The successful Bidder is required to execute a written Public Works Contract with the City, including all Addenda and Exhibits, upon award.
2. The Contract must be executed, and all required insurance, certificates, endorsements, and bonds must be provided within ten (10) calendar days of receipt from the City.
3. Failure or refusal to execute the Contract or meet these requirements may result in annulment of the award and forfeiture of the Bid security, and the City may proceed to award the Contract to the next lowest responsive, responsible Bidder
4. A sample Public Works Contract is included as an [ATTACHMENT](#).

**END OF SECTION**

**00 52 14 CONTRACTOR DECLARATION FORM**

**A. Summary**

1. The Contractor Declaration Form is required to be completed, signed, and submitted with the bid.
  - a. Refer to [00 43 00 REQUIRED BID DOCUMENTS – Contractor Declaration Form](#).
2. This form requires the Bidder to certify, under penalty of perjury, that the information provided is true and correct and that the individual signing is authorized to make the declaration on behalf of the Bidder.
3. The certification affirms that, within the past three (3) years, the Bidder has not been found to have willfully violated applicable wage payment laws under Chapters 49.46, 49.48, or 49.52 RCW.
4. Failure to submit a signed Contractor Declaration Form will result in the bid being deemed non-responsive and rejected.

**END OF SECTION**

**00 52 15 BIDDER IDENTIFICATION, SIGNATURE SHEET, AND DECLARATION**

A. Summary

1. The Bidder Identification, Signature Sheet, and Declaration Form is required to be completed, signed, and submitted with the bid.
  - a. Refer to [00 43 00 REQUIRED BID DOCUMENTS – Bidder Identification, Signature Sheet, and Declaration](#).
2. This form requires the Bidder to provide identifying information, including legal name, business structure, contractor license number, UBI number, and primary contact details.
3. The form includes a signature sheet and declaration certifying, under penalty of perjury, that the bid is submitted without collusion and that the individual signing is authorized to bind the Bidder to the terms of the bid.
4. Failure to submit a signed Bidder Identification, Signature Sheet, and Declaration Form will result in the bid being deemed non-responsive and rejected.

**END OF SECTION**

**00 60 06 SUBMITTAL FORM**

A. Summary

1. The Submittal Form is used by the Contractor to transmit project submittals to the City and Design Professional for review.
2. The form identifies submittal details and documents the review status and comments.
3. Use of this form does not relieve the Contractor of responsibility for compliance with the Contract Documents, coordination of work, or accuracy of submitted information.
4. The Submittal Form is included as an [ATTACHMENT](#).

**END OF SECTION**

**00 61 16 PAYMENT BOND FORM**

A. Related Documents

1. [00 72 13 GENERAL CONDITIONS](#)

B. Summary

1. The Payment Bond is required to be executed and submitted by the successful Contractor upon award.
2. This bond guarantees that the Contractor will pay all laborers, subcontractors, suppliers, and applicable taxes associated with the Work in accordance with RCW 39.08, RCW 39.12, and RCW 60.28.
3. The bond must be issued by an approved surety authorized to do business in the State of Washington and include a Power of Attorney.
4. The Payment Bond Form is included as an [ATTACHMENT](#).

**END OF SECTION**

**00 61 19 PERFORMANCE BOND FORM**

A. Related Documents

1. [00 72 13 GENERAL CONDITIONS](#)

B. Summary

1. The Performance Bond is required to be executed and submitted by the successful Contractor upon award.
2. This bond guarantees that the Contractor will faithfully perform all obligations of the Contract, including all terms, conditions, and approved modifications.
3. The bond must be issued by an approved surety authorized to do business in the State of Washington and include a Power of Attorney.
4. The Performance Bond Form is included as an [ATTACHMENT](#).

**END OF SECTION**

**00 61 23 RETAINAGE ELECTION FORM**

A. Related Documents

1. [00 72 13 GENERAL CONDITIONS](#)

B. Summary

1. The Retainage Election Form is required to be executed and submitted by the successful Contractor upon award.
2. This form allows the Contractor to select the method for handling retainage withheld from progress payments in accordance with RCW 60.28.
3. The form must be completed, signed, and, if applicable, include designated financial institution information for retainage options.
4. The Retainage Election Form is included as an [ATTACHMENT](#).

**END OF SECTION**



**00 62 76 PAYMENT APPLICATION FORM**

A. Related Documents

1. [00 72 13 GENERAL CONDITIONS](#)

B. Summary

1. The Payment Application Form is required to be completed and submitted by the Contractor to request progress payments.
2. This form documents the value of work completed to date, including quantities, prior payments, retainage, and the amount due for the current period.
3. The form must be completed, certified by the Contractor, and reviewed by the Design Professional in accordance with the Contract Documents.
4. The Payment Application Form is included as an [ATTACHMENT](#).

**END OF SECTION**

**00 62 86 WEEKLY STATEMENT OF WORKING DAYS FORM**

**A. Summary**

1. The Weekly Statement of Working Days Form is required to be completed and submitted by the Contractor on a weekly basis.
2. This form documents the number of working and non-working days charged to the Contract, including weather conditions and reasons for unworkable days.
3. The form is used to track contract time and progress, and must be reviewed and acknowledged by the Contractor and the Owner's Representative.
4. The Weekly Statement of Working Days Form is included as an [ATTACHMENT](#).

**END OF SECTION**

**00 62 91 WAGE COMPLIANCE CERTIFICATION FORM**

A. Related Documents:

1. [00 21 13 INSTRUCTIONS TO BIDDERS](#)

B. Summary

1. This form requires the Bidder to certify, under penalty of perjury and in accordance with RCW 9A.72.085, compliance with the responsible bidder requirements of RCW 39.04.350(1)(g), including that the Bidder has not been determined to be a willful violator of wage payment laws under Chapters 49.46, 49.48, or 49.52 RCW within the past three (3) years.
2. Upon request by the City, the Bidder shall provide supporting documentation within five (5) days in accordance with the Evaluation of Bidder Responsibility requirements identified in the [00 21 13 INSTRUCTIONS TO BIDDERS](#).
3. The Wage Compliance Certification Form is included as an [ATTACHMENT](#).

**END OF SECTION**

**00 63 13 REQUEST FOR INFORMATION FORM**

A. Related Documents

1. [00 72 13 GENERAL CONDITIONS](#)

B. Summary

1. The Request for Information (RFI) Form is used by the Contractor to request clarification or interpretation of the Contract Documents.
2. This form documents the Contractor's inquiry, including potential cost and schedule impacts, and provides a mechanism for the City or Design Professional to issue a formal response.
3. Use of this form does not authorize changes to the Work or direct the Contractor to proceed.
4. The RFI Form is included as an [ATTACHMENT](#).

**END OF SECTION**

**00 63 25 SUBSTITUTION REQUEST FORM (DURING CONSTRUCTION)**

**A. Summary**

1. The Substitution Request Form is used by the Contractor to request approval for a proposed substitution of a specified product during construction.
2. This form requires detailed information demonstrating that the proposed substitution is equal in quality, performance, and appearance, including impacts to cost, schedule, design, and coordination with other trades.
3. Use of this form does not authorize the substitution; approval must be granted by the City or Design Professional prior to incorporation into the Work.
4. The Substitution Request Form is included as an [ATTACHMENT](#).

**END OF SECTION**

**00 63 33 ARCHITECT'S SUPPLEMENTAL INSTRUCTION FORM**

**A. Summary**

1. The Architect's Supplemental Instruction (ASI) Form is used by the City or Design Professional to issue clarifications or minor changes to the Work in accordance with the Contract Documents.
2. This form provides direction that does not change the Contract Sum or Contract Time unless otherwise noted, and documents the Contractor's acknowledgment of or response to the instruction.
3. Failure to respond within the specified time may be deemed acceptance of the instruction without changes to the Contract Sum or Contract Time.
4. The ASI Form is included as an [ATTACHMENT](#).

**END OF SECTION**

**00 63 63 CHANGE ORDER FORM**

A. Related Documents

1. [00 72 13 GENERAL CONDITIONS](#)

B. Summary

1. The Change Order Form is used to document and authorize changes to the Contract, including adjustments to the Contract Sum, Contract Time, or scope of Work.
2. This form provides a detailed description of the proposed changes, identifies impacts to cost, schedule, and insurance, and includes a breakdown of associated costs.
3. Execution of this form constitutes a formal amendment to the Contract and must be signed by both the Contractor and the City.
4. The Change Order Form is included as an [ATTACHMENT](#).

**END OF SECTION**

## **00 72 13 GENERAL CONDITIONS**

### **PART 01 GENERAL**

#### **1.01 GENERAL**

- A. All work included in this Project shall be done according to the Plans and Technical Specifications attached herein.

#### **1.02 REFERENCE STANDARDS**

- A. AIA A201 - General Conditions of the Contract for Construction.

#### **1.03 DEFINITIONS**

- A. City or Owner: May be used interchangeably and refer to the City of Mercer Island.
- B. Addendum or Addenda: Alteration or clarification of the plans or specifications provided to bidders by City prior to bid time, which becomes part of the Contract Documents when the Contract is executed.
- C. Apprentice: An apprentice in an apprenticeship program approved or recognized by the Washington State Apprenticeship and Training Council (WSTAC).
- D. Apprentice Utilization Requirement: The minimum percentage of overall Labor Hours that must be worked by Apprentices for contracts subject to the Utilization Program.
- E. Change Order: A written instrument designated to be a Change Order which alters the Contract, and identifies the following: (1) a change in the Work; (2) a change in Contract Price; and/or (3) a change in Contract Time.
- F. Change Proposal: A document prepared by the Contractor at the request of City, which proposes changes to the Work and/or changes to the Contract Price and/or Contract Time. City initiates all requests for Change Proposals.
- G. Claim: A written demand by the Contractor seeking (1) a change to Contract Price; (2) a change of Contract Time; (3) a payment of money or damages; and/or, (4) any other relief arising out of or relating to this Contract.
- H. Contract or Contract Documents: The entire integrated agreement between City and the Contractor for the performance of the Work in accordance with the Contract Documents. The Contract Documents include the following:
  - 1. The signed Agreement between City and Contractor (the "Public Works Contract");
  - 2. The Contractor's completed Bid Form;
  - 3. The City's General Terms and Conditions (November 2024 ed.);



4. Any Supplemental or Special Conditions;
  5. Technical Specifications;
  6. Drawings;
  7. Addenda; and
  8. Any Change Orders.
- I. Contract Execution: Occurs when City Manager or his/her designee signs the Contract, which shall only occur after the Contractor signs the Contract.
  - J. Contract Price: The total amount payable by City to the Contractor for performance of the Work in accordance with the Contract.
  - K. Contract Time: The number of days or the specific date set forth in the Contract to achieve Substantial Completion of the Work.
  - L. Contract Work or Work: The labor, supervision, materials, equipment, supplies, services, other items, and requirements of the Contract necessary for the execution, completion and performance of all requirements of the Contract by the Contractor to the satisfaction of City.
  - M. Contractor: The individual, association, partnership, firm, company, corporation, or combination thereof, including joint ventures, contracting with City to do the Contract Work.
  - N. Critical Path: The longest, continuous sequence of interrelated activities that begins at the start of the Project (Notice to Proceed) and extends to Substantial Completion of the Project. These activities are critical because delay to an activity on this path will extend Contract Time.
  - O. Day: A calendar day, unless otherwise specified.
  - P. Differing Site Conditions: (1) Subsurface or latent physical conditions at the site which differ materially from those indicated in the Contract Documents (Type I), or (2) Unknown physical conditions at the Site, of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inherent in the construction activities of the character provided for in the Contract (Type II).
  - Q. Engineer or Design Professional: The City representative who administers the Contract for the City.
  - R. Final Acceptance: Written acceptance of the Project by City.
  - S. Force Majeure: An event that is unforeseeable at the time of Contract Execution and that is beyond the reasonable control of the Contractor and City and includes:
    1. Natural Disaster declared by Governor of Washington or President of the United States, including but not limited to earthquakes;

2. Acts or omissions of any government entity acting within its governmental capacity;
  3. Fire and/or flood for which the Contractor or its Subcontractors is not responsible;
  4. Quarantine or epidemic;
  5. Strike or defensive lockout;
  6. Unusually Severe Weather Conditions; and
  7. Acts of terrorism.
- T. Good Faith Effort (GFE): is a detailed description of the effort made by a Contractor to meet the Apprenticeship Utilization Requirement for a project through good faith including but not limited to specific steps as described elsewhere in this specification. If a contractor is not meeting the Apprenticeship Utilization Requirement but can demonstrate they have put in a good faith effort to do so, they can qualify for a reduction or waiver of the requirement.
- U. Hazardous Material: Any pollutant, contaminant, toxic or hazardous waste, dangerous substance, potentially dangerous substance, noxious substance, toxic substance, flammable material, explosive material, radioactive material, urea formaldehyde foam insulation, asbestos, PCBs, or any other substances the removal of which is required, or the manufacture, preparation, production, generation, use, maintenance, treatment, storage, transfer, handling, or shipment of which is restricted, prohibited, regulated, or penalized by any and all federal, state, City, or municipal statutes or laws and regulations promulgated thereunder, now or at any time hereafter in effect, including, but not limited to, the Comprehensive Environmental Response, Compensation, and Liability Act (42 U. S. C. §§ 9601, *et seq.*), the Hazardous Materials Transportation Act (49 U. S. C. §§ 1801, *et seq.*), the Resource Conservation and Recovery Act (42 U. S. C. §§ 6901, *et seq.*), the Federal Water Pollution Control Act (33 U. S. C. §§ 1251, *et seq.*), the Clean Air Act (42 U. S. C. §§ 7401, *et seq.*), the Toxic Substances Control Act, as amended (15 U. S. C. §§ 2601, *et seq.*), the Occupational Safety and Health Act (29 U. S. C. §§ 651, *et seq.*, and the Model Toxics Control Act (RCW 70.105), or similar state or local statute or code), as the laws have been amended and supplemented.
- V. Labor Hours: The total hours performed by all workers receiving an hourly wage who are directly employed upon the project and who are subject to state and federal prevailing wage requirements, including hours performed by workers employed by the Contractor and all subcontractors. Labor Hours shall include additional hours worked as a result of Contract adjustment or pursuant to an agreed-upon change order.
- W. Notice: A written document issued by the Engineer or Contractor's Representative which is submitted to the other party and delivered by:
1. Depositing in the U.S. Mail (or other method of commercial express mail), which notice shall be effective on the date of receipt;

2. Service on the Parties' representative or at the Contractor's home office or field office, which notice shall be effective on the date of service; or,
  3. Facsimile to the Parties' representative or Contractor's home office or field office, which notice shall be effective upon receipt.
- X. Notice To Proceed: A written directive issued by City authorizing the Contractor to perform some or all of the Work.
- Y. Overhead: Charges that may be incurred or allocated in support of the Contract but are not part of the cost of directly performing the physical Contract construction activity. Overhead includes Site or Field Overhead and Home Office Overhead.
1. Site or Field Office Overhead. Site or Field Overhead costs are typically those costs that are related to, but are not limited to supervision, including general foremen and their supervisors, planners, schedulers, engineers, managers, etc. and the direct payroll costs of their project-related service, clerical salaries and their direct payroll costs, the costs of all vehicles, travel, meal and lodging costs associated with those personnel, Site or Field office and utility expense, expenses associated with all regulatory compliance, Hand and Other Small Tools provided by the Contractor for the use of its forces, all expendable supplies, and all other items incidental to or integral in supporting the physical completion of the Work.
  2. Home Office Overhead. Home office Overhead costs are typically those that include all general office expenses. Such costs include, but are not limited to those associated with officer and office salaries and related payroll taxes and benefits, costs of office occupancy and maintenance, all supporting services (such as utilities, office machines computers, and related items and support) related to the home office function, business taxes and licenses, and all such other costs necessary to operate the business entity. Home office overhead includes unabsorbed home office overhead.
  3. In addition to the above, whether treated as Site or Field Overhead or as Home Office Overhead, costs of any and all bonds, insurance(s), and taxes associated with this Contract are to be considered as Overhead. All items as those identified above are to be treated as Overhead for this purpose regardless of how the Contractor chooses to account for them in its books of account.
  4. Under no circumstances shall City pay the Contractor for direct or allocated costs or charges for officer bonus and profit sharing, project personnel bonuses, charitable contributions, income taxes, or any costs relating to illegal activity.
- Z. Parties: The Contractor and City.
- AA. Project: All activity relative to this Contract including activity of the Contractor, its Subcontractors, and City.

- BB. Request for Change Order: A document, designated as a Request for a Change Order, prepared by the Contractor requesting either (1) a change in Contract Price; (2) a change in Contract Time; (3) a change in the Work; (4) a payment of money or damages; and/or, (5) any other relief arising out of or relating to this Contract.
- CC. Request for Information: A request from the Contractor to City seeking an interpretation or a clarification of some requirement of the Contract Documents.
- DD. Site or Project Site: The location, at which construction, equipment or services furnished by the Contractor under the Contract will be performed, completed and/or delivered.
- EE. Subcontractor: An individual, firm, partnership, or corporation having a contract, purchase order, or agreement with the Contractor, or with any Subcontractor of any tier for the performance of any part of the Contract. When City refers to Subcontractor(s) in this document, for purposes of this document and unless otherwise stated herein, the term Subcontractor(s) includes, at every level and/or tier, all subcontractors and subconsultants.
- FF. Substantial Completion. That stage in the progress of the Work where:
1. City has full and unrestricted use and benefit of the Project for the purpose intended;
  2. All the systems and parts of the Contract Work are functional;
  3. Utilities are connected and operate normally;
  4. Only minor incidental work or correction or repair remains to complete all Contract requirements; and
  5. The City has received all certificates of occupancy and any other permits, approvals, licenses and other documents from any governmental authority with jurisdiction necessary for beneficial occupancy of the project.
- GG. Supplier(s): Any person or firm who is not performing work or supplying labor on Site and is engaged in the business of supplying a manufactured product or resource to City, Contractor, or Subcontractors. The term Suppliers includes materialmen, manufacturers, and fabricators.

#### **1.04 INTENT AND INTERPRETATION OF THE DOCUMENTS**

- A. This Project Manual constitutes the Contract entered into by the City and any successful Bidder. In the event there is any discrepancy between any of the Contract Documents, the following order of documents governs so that the former prevails over the latter: Contract, Technical Specifications, General Provisions, Instructions to Bidders, Invitation to Bid, and Bid Proposal and Bid Form.
- B. The Contract Documents constitute the entire and integrated agreement between the parties hereto and supersede all prior negotiations, representations, or agreements, either written or oral.

- C. The Contract Documents shall not be construed to create a contractual relationship between any parties other than City and the Contractor. No contract between City and a third party shall be construed to create any duty on the part of City or such third party to the Contractor. The Contractor is not an intended or incidental beneficiary of any promises made in City's contract with a third party, if any.
- D. The Contract Documents are intended to be complementary. What is required by one part of the Contract shall be as binding as if required by all. Should any conflict or inconsistency be found in the Contract Documents, the provision imposing the more expensive duty or obligation on the Contractor shall take precedence.
- E. The words "similar," "typical" (or other equivalents) shall mean nearly corresponding or having a likeness. Such words shall not be construed to mean that all parts of the Work referred to are identical or substantially identical, or that such elements of the Work are connected identically or substantially identically to the rest of the Work. The Contractor has the responsibility to determine all details of the Work in relation to their location and connection to other parts of the Work. The singular includes the plural and vice versa. Male includes female and vice versa.
- F. The organization of the specifications into divisions, provisions and articles and the organization of the drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

#### **1.05 CLARIFICATION OF DRAWINGS AND DETAIL DRAWINGS**

- A. Where on any drawing a portion of the Work is drawn out and the remainder is indicated in outline, the drawn-out parts shall apply also to other similar portions of the Work. Where ornament or other detail is indicated by starting only, such detail shall be continued throughout the courses or parts in which it occurs and shall apply to all other similar parts of the Work, unless otherwise indicated.
- B. With regard to drawings the following shall apply:
- C. Written dimensions shall be followed; drawings may not be to scale.
- D. Figure dimensions on drawings shall govern over scale dimensions; and detail drawings shall govern over general drawings.

### **PART 02 CITY**

#### **2.01 AUTHORITY**

- A. Unless City, in writing, indicates otherwise, the authority to (1) commit to or bind City to any Change Orders or change in the Work, Contract Price and/or Contract Time; or (2) sign the Contract or Change Orders rests solely in the City Manager or his or her designee.

- B. The Engineer shall have the authority to administer the Contract. Administration of the Contract by the Engineer includes but is not limited to:
  - 1. Receiving all correspondence and information from the Contractor;
  - 2. Issuing request for Change Proposals;
  - 3. Responding to Requests For Information;
  - 4. Reviewing the schedule of values, project schedules, submittals, testing and inspection reports, substitution requests, and other documentation submitted by the Contractor;
  - 5. Negotiating Change Proposals and Change Orders;
  - 6. Recommending Change Orders for approval by the City Manager or its designee;
  - 7. Issuing decisions with respect to Requests for Change Orders and Claims;
  - 8. Processing payment requests submitted by the Contractor, and recommending payment;
  - 9. Monitoring the quality of the Work, rejecting noncompliant Work, and recommending acceptance of the Work;
  - 10. Transmitting executed Change Orders, amendments, and other Contract correspondence to the Contractor; and
  - 11. Performing all other contract administrative functions.
- C. All correspondence, questions, and/or documentation shall be submitted to the Engineer.
- D. The Engineer may designate representatives to perform functions under the Contract, such as review and/or inspection and acceptance of supplies, services, including construction, and other functions of a technical or administrative nature.

## **2.02 INFORMATION SUPPLIED BY CITY**

- A. Unless otherwise specifically provided in the Contract, surveys and site information provided by City are intended to describe the general physical characteristics of the Site. City does not represent that this information is complete or sufficient for the Contractor's performance of the Work.
- B. City shall furnish to the Contractor a copy of the Contract Documents. The Contractor shall pay City for any additional copies of Contract Documents.

## **2.03 WORK BY CITY OR SEPARATE CONTRACTORS**

- A. City reserves the right to perform work not included in the Contract or to let other contracts in connection with this Project. The Contractor shall coordinate its Work with City and other City contractors and, at City's request, participate in meetings for the purpose of coordinating the Contractor's construction schedule with those of other contractors at no additional cost to City.

## **PART 03 CONTRACTOR**

### **3.01 CONTRACTOR REPRESENTATIVES**

The Contractor makes the following representations to City:

- A. Before submission of its bid, the Contractor has:
  - 1. Carefully reviewed the Contract Documents, and visited and examined the Site;
  - 2. Become familiar with the general and local conditions in which the Work is to be performed, and satisfied itself as to the nature, location, character, quality and quantity of Contract 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 reasonably ascertainable subsurface conditions and other matters that may be encountered at the Site or affect performance of the Work or the cost or difficulty thereof;
  - 3. Become familiar with and satisfied itself as to the conditions bearing upon transportation, disposal, handling, and storage of materials; and
  - 4. Become familiar with and satisfied itself as to the availability of labor, water, electric power, and roads; and the uncertainties of access, traffic, parking and weather. Any failure of the Contractor to take the action described in this provision (3.0) or elsewhere in the Contract Documents will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the Work, or for proceeding to successfully perform the Work without additional expense to City.
- B. The Contract Price is reasonable compensation for the Work and the Contract Time is adequate for the performance of the Work as represented by the Contract, site visit, and the general conditions (including but not limited to weather, site, soil) known or reasonably anticipated for the Site.

### **3.02 GENERAL DUTIES**

- A. The Contractor shall give sufficient supervision to the Work, using its best skill and attention. The Contractor is on notice that City will be relying on the accuracy, competence and completeness of the Work. The Contractor shall supervise and be solely responsible for the proper performance of the Work in accordance with the Contract, including the construction means, methods, techniques, sequences, procedures, and for coordination of all portions of the Work.
- B. Unless specified elsewhere in the Contract, the Contractor shall provide and pay for all labor, materials, equipment, tools, construction machinery, utilities, transportation, and other facilities and services (including federal and state tax, industrial insurance, social security liability and all other applicable taxes) necessary for the proper execution and completion of the Work.

- C. The Contractor shall also provide sufficient staffing and supervision to process Requests for Information, Change Proposals, Submittals, Change Orders, close out documentation, and to perform all other requirements of the Contract and all Work.
- D. The Contractor shall lay out its Work from baselines and benchmarks indicated in the Contract, if any, and shall be responsible for the accuracy of all field measurements and surveys used in the lay out.

### **3.03 DUTY TO INSPECT CONTRACT DOCUMENTS**

- A. The Contractor shall carefully study and compare all Contract Documents and check the conditions, dimensions, and instructions as stated therein. Contractor will not be required to provide professional services which constitute the practice of architecture and engineering except to the extent provided for in the technical specifications and drawings.
- B. The Contractor shall immediately notify City in writing of any:
- C. Error, inconsistency, or omission in the Contract Documents that a reasonable contractor knew or through the exercise of reasonable diligence should have discovered under the same and similar circumstances;
- D. Requirement in the Contract Documents that conflict with any local, state, and federal laws, regulations and/or permits, licenses, and easement conditions that a reasonable contractor knew or through the exercise of reasonable diligence should have discovered under the same and similar circumstances.
- E. The Contractor should not proceed with the work in question until the Contractor receives written direction from the Engineer.
  - 1. If the Contractor proceeds with the work in question without written direction from the Engineer, the Contractor shall be responsible for any costs or damages associated with:
  - 2. Fines or penalties;
  - 3. Demolition, tear out, removal, cleanup, remediation, or fixing the work in question; and
  - 4. Delay, disruption, and loss of productivity.

### **3.04 CONTRACTOR'S SUPERVISION AND EMPLOYEES**

- A. Contractor shall provide qualified and competent people to administer the contract and perform all the Work.
- B. During performance of the Work the Contractor shall have supervisory personnel on-site and available to administer, manage and coordinate the Work. City shall not be responsible for the acts or omissions of the supervisory personnel or their assistants.



- C. The Contractor shall at all times enforce good order among all persons furnishing labor or materials on-site and shall only employ workers skilled in the work assigned. If requested by the Project Representative, Contractor shall provide the Project Representative with copies of licenses, registrations, and certifications.
  - 1. City shall have the right to require the Contractor to remove personnel from the Site that do not have the appropriate qualifications and experience to meet or uphold the requirements of the Contract. City shall also have the right to order the Contractor to replace personnel who demonstrate unprofessional behavior.
  - 2. Failure by City to require removal of any Contractor personnel shall not be deemed an admission that any such personnel are satisfactory, nor shall such failure relieve the Contractor from any contractual responsibility.

### **3.05 SUBCONTRACTORS AND SUPPLIERS**

- A. This Contract is between City and the Contractor.
  - 1. The Contractor's subcontracting shall not create a contract between City and the Subcontractor and Suppliers. Subcontractors and Suppliers are not intended as incidental third-party beneficiaries to the Contract. The Subcontractor and Suppliers shall have no rights against City by reason of their agreements with the Contractor.
  - 2. The Contractor is responsible for performing all work required by the Contract. The Contract has not been written with the intent of, and City shall not be a party to, defining the division of work between the Contractor and its Subcontractors and Suppliers.
- B. Selection of Subcontractors and Suppliers
  - 1. Subcontractors and Suppliers shall be properly licensed, registered or certified, as applicable, and capable to perform the assigned work.
  - 2. If requested by City, the Contractor shall provide documentation that the proposed Subcontractors and Suppliers have adequate experience and skill.
  - 3. The Contractor shall require each Subcontractor and Supplier to comply with all provisions of this Contract. At the request of Subcontractors or Suppliers, Contractor shall make available for copying all Contract Documents.
- C. Responsibility for Work of Subcontractors and Suppliers
  - 1. The Contractor shall be responsible for the acts and omissions of Subcontractors and Suppliers. The Contractor shall also be responsible for the suitability of any materials, components, equipment or supplies furnished by a Subcontractor and/or Supplier irrespective of whether such were designated or approved by City.

### **3.06 SCHEDULE OF WORKING HOURS**

- A. As specified in the Contract, the Contractor shall submit a schedule of working hours, including overtime to City for acceptance. This schedule shall comply with all Contract requirements. Except as permitted elsewhere in the Contract Documents or in the case of an emergency, all Work at the Site shall be performed between the hours of 7am and 6 pm Monday through Friday.
- B. The schedule of working hours accepted by City shall be the only schedule used by the Contractor during performance of the Contract, unless amended to maintain Work progress.
- C. The Contractor shall provide 48 hours advance written Notice of any intent to work outside of approved working hours. Any work at the Site performed outside approved working hours shall be performed without additional expense to City, except as otherwise provided in the Contract Documents. Contractor shall comply with Mercer Island Code Section 8.24.020 (Q) which prohibits construction related noise outside designated hours except in cases of emergency or demonstrated necessity.

### **3.07 RECORD DOCUMENTS**

- A. The Contractor shall maintain an accurate, readable, and orderly set of drawings and specifications, updated as the job progresses to show all approved changes, options, alternates, and all actual deviations from the original Contract Documents. This set of drawings and specifications shall be the Record Documents.
  - 1. The Record Documents shall be maintained in hard copy.
  - 2. In addition to all approved changes, options, alternates, and all actual deviations from the original Contract Documents, the Record Documents shall be marked as follows:
    - a. Record all materials used where options, alternates and/or change orders were indicated, specified and/or authorized;
    - b. Accurate measurements referenced as required by the technical specifications shall be recorded to show the exact location and changes in direction of all underground services and utilities, as well as their depth below finished grade; and
    - c. Record all other requirements as specified in the Technical Specifications.
- B. The Record Documents shall be kept up-to-date and be available for review by City at all times, including but not limited to at each job progress meeting. Failure to have the record set up to date shall be sufficient reason for City to withhold payment in accordance with paragraph 7.2, Payments Withheld, until all such information is recorded.
- C. Record Documents may be used to assist City to verify the appropriate progress payment.

- D. Neither Final Acceptance nor Final Payment will be issued until a complete set of Record Documents is submitted and the Engineer is satisfied as to its quality and accuracy.

### **3.08 COST RECORDS**

- A. The Contractor, Subcontractors, and Suppliers shall maintain Project cost records by cost codes and shall segregate and separately record at the time incurred all costs (1) directly associated with each work activity and (2) directly or indirectly resulting from any event or condition for which the Contractor seeks an adjustment in the Contract Price, Contract Time, and/or damages.
1. Any costs claimed to result from any such event or condition, including, but not limited to, delay and impact costs, acceleration costs, loss of productivity or efficiency, and increased or extended overhead shall be recorded at the time incurred and be fairly and reasonably allocated to each such event or condition and to other causes of such costs.
  2. City shall be provided with a detailed description of all such costs and the basis of allocation. The Contractor, Subcontractors, and Suppliers shall maintain a monthly summary of all costs and shall make all underlying cost records and monthly summary of costs available for review, inspection, and copying by City upon request.
  3. Any work performed for which the Contractor intends to seek an adjustment in Contract Price and/or Contract Time shall be recorded on the same day the work is performed and kept separate so as to distinguish it from Contract Work.
- B. In addition to the requirements set forth in Part 5, Changes to the Contract, and Part 6, Time and Price Adjustments, the Contractor shall be entitled to extra compensation for an event or condition and/or the recovery of damages only to the extent that the Project cost records are kept in full compliance with all Contract requirements and the cost allocations support entitlement to such compensation.

### **3.09 MAINTENANCE AND INSPECTION OF DOCUMENTS**

- A. All Contractor's, Subcontractors', and Suppliers' documents and records relating to the Contract shall be open to inspection, audit, and/or copying by City or its designee:
1. During the Contract Time; and
  2. For a period of not less than six years after the date of Final Acceptance of the Contract ("Preservation Period"); or if any Claim, audit or litigation arising out of, in connection with, or related to this Contract is initiated, all documents shall be retained until such Claim, audit or litigation involving the records is resolved or completed, whichever occurs later.
- B. The Contractor shall also guarantee that all Subcontractor and Supplier documents shall be retained and open to similar inspection, audit and/or copying during the Contract Time and also the Preservation Period. The Contractor, Subcontractor, and Supplier shall use its best efforts to cooperate with the inspection, auditing, and/or copying.

- C. Inspection, audit, and/or copying of all documents described herein, may be performed by City or its designee at any time with not less than seven (7) days' Notice. Provided however, if an audit or inspection is to be commenced more than sixty (60) days after the Final Acceptance date of the Contract, the Contractor will be given twenty (20) days' Notice of the date of the audit.
- D. The Contractor, Subcontractors, and Suppliers shall provide adequate facilities, acceptable to City, for inspection, auditing, and/or copying during normal business hours.
- E. If the Contractor is formally dissolved, assigns or otherwise divests itself of its legal capacity under this Contract, then it shall immediately notify City and preserve such records, at its expense, as directed by City.
- F. The Contractor, Subcontractor, and Supplier shall be subject to audit at any time with respect to this Contract. Failure to maintain and retain sufficient records to allow City to verify all costs or damages or failure to permit City access to the books and records shall constitute a waiver of the rights of the Contractor Subcontractor and Supplier to Claim or be compensated for any damages, additional time or money under this Contract.
- G. At a minimum, the following documents, including the machine-readable electronic versions, shall be available for inspection, audits, and/or copying:
  - 1. Daily time sheets and all daily reports, Supervisor's reports, and inspection reports;
  - 2. Collective bargaining agreements;
  - 3. Insurance, welfare, and benefits records;
  - 4. Payroll registers;
  - 5. Earnings records;
  - 6. All tax forms, including payroll taxes;
  - 7. Material invoices and requisitions;
  - 8. Material cost distribution worksheet;
  - 9. Equipment records (list of Contractor's, Subcontractors', and Suppliers' equipment, rates, etc.);
  - 10. Contracts, purchase orders and agreements between the Contractor and each Subcontractor and Supplier;
  - 11. Subcontractors' and Suppliers' payment certificates;
  - 12. Correspondence, including email, with Subcontractors and/or Suppliers;
  - 13. All meeting notes by and between Contractor, Subcontractors, Suppliers and/or any third parties related to the Project;

14. Canceled checks (payroll and vendors);
15. Job cost reports, including monthly totals;
16. Job payroll ledger;
17. Certified payrolls;
18. General ledger;
19. Cash disbursements journal;
20. Take off sheets, and calculations used to prepare the bid and/or quotes;
21. Take off sheets, calculations, quotes, other financial data to support change proposals, request for change order and/or claims;
22. Financial statements for all years during the Contract Time. In addition, City may require, if it deems appropriate, additional financial statements for 3 years preceding execution of the Contract and 6 years following Final Acceptance of the Contract;
23. Depreciation records on all Contractor's, Subcontractor's, and Supplier's equipment, whether these records are maintained by the Contractor, Subcontractors, and Suppliers involved, its accountant, or others;
24. If a source other than depreciation records is used to develop costs for the Contractor's internal purposes in establishing the actual cost of owning and operating equipment, all such other source documents;
25. All documents which relate to each and every Claim together with all documents which support the amount of damages as to each Claim;
26. Worksheets 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, Suppliers, all documents which establish time periods, individuals involved, the hours for the individuals, and the rates for the individuals;
27. Worksheets, software, and all other documents used (a) by the Contractor to prepare its bid and schedule(s) and/or (b) to prepare quotes and bids to the Contractor;
28. All schedule documents, including electronic versions, planned resource codes, or schedules and summaries;
29. All submittals; and
30. All other documents, including email, related to the Project, Claims, or Change Orders.

- H. The Contractor shall mark any documentation it considers proprietary or confidential accordingly. Such information will be treated as such by City; however, City cannot ensure that this information will not be subject to release pursuant to a public records request. In the event City receives a request for such information, City will advise the Contractor and will not release the requested information for a period of not less than ten (10) days in order to give the Contractor an opportunity to obtain a court order prohibiting the release of the information in response to the public records request.

### **3.10 MAINTENANCE AND SITE CLEANUP**

- A. The Contractor shall at all times keep the Site, access points, and public rights-of-way free from accumulation of dirt, mud, waste materials or rubbish caused by the Contractor or Subcontractors. At the completion of the Contract Work, the Contractor shall remove and lawfully dispose of all its dirt, mud, waste materials, rubbish, tools, scaffolding and surplus or partly used materials from the Site and shall leave the Site broom clean unless some stricter standard is specified in the Contract.
- B. The Contractor shall obey all applicable laws and regulations relating to the storage, use, and disposal of Hazardous Materials. The Contractor shall promptly notify City of all Contractor or Subcontractor caused spills or releases of Hazardous Materials, and pay the cost to promptly clean up all such spills or releases and any associated fines or penalties. The Contractor shall maintain documentation of the clean up and disposal all Contractor or Subcontractor caused spills or releases of Hazardous Materials.
- C. If the Contractor fails to adequately maintain or cleanup the Site, City may, after written Notice to the Contractor, sweep surfaces or remove the dirt, mud, waste materials, rubbish, or hazardous materials and charge all reasonable costs of such work to the Contractor.

### **3.11 PROTECTION OF EXISTING STRUCTURES, EQUIPMENT, VEGETATION, UTILITIES, AND IMPROVEMENTS**

- A. Contractor shall protect from damage all existing structures, curbs, gutters, sidewalks, equipment, improvements, utilities, trees, and vegetation not shown in the Contract Documents to be removed or modified at or near the Site. Contractor shall repair, at no cost to City, any such damage resulting from failure to comply with the requirements of the Contract or failure to exercise reasonable care in performing the Work. If Contractor fails or refuses to repair the damage promptly, City may have the necessary work performed and deduct or charge the cost to Contractor or exercise its rights under the Performance and Payment Bond. If there are insufficient funds remaining, excluding retention, the Contractor shall pay City for the costs associated with protection and repairing the damages.

### **3.12 PERMITS, LAWS, REGULATIONS AND TAXES**

- A. Except those permits, easements, and variances specified in the Contract as having been previously obtained by City, all permits, licenses, easements and variances necessary for the execution of the Work shall be secured and paid for by the Contractor. The Contractor shall identify, apply for, and pay for such permits and licenses at the earliest possible time so as to avoid any delay to the Work arising from the permitting and/or licensing process. No actions taken by City to aid the Contractor in securing

any permit or license shall relieve the Contractor of any obligations to secure any such permit or license.

- B. The Contractor shall maintain all stamped permit sets of documents at the Site during construction, in good condition and as required by local ordinances.
- C. The Contractor shall perform the Work in full compliance with local, state and federal laws, ordinances, resolutions and regulations, and with permit, license, easement, and variance conditions pertaining to the conduct of the Work. The Contractor shall defend, indemnify, and hold City, its elected officials, officers, agents and employees harmless from any assessment of fines, penalties, or damages arising from violations of the same by the Contractor or Subcontractors. The Contractor shall pay and provide proof of payment for any assessments of fines, penalties or damages. The Contractor shall cooperate with all governmental entities regarding inspection of the Work and compliance with such requirements.
- D. The bid form may include a line item for sales tax on the whole amount, or on items which are not exempt from tax under Washington State Department of Revenue rules, including WAC 458-20-170 and WAC 458-20-171. Unless there are separate line items in the bid form for Washington State sales tax, Contractor shall include all sales tax in its lump sum bid or unit prices. The Contractor should contact the Washington State Department of Revenue for answers to questions in this area. The City will not adjust its payment if the Contractor bases a bid on a misunderstood tax liability. Except as provided above, the Contractor is required to pay all applicable taxes. No adjustment will be made in the amount to be paid by City under the Contract because of any change in law or regulations covering any applicable taxes, or because of any misunderstanding by the Contractor as to its liability for or the amount of any taxes.

### **3.13 PATENTS AND ROYALTIES**

- A. The Contractor shall assume all costs or fees relating to royalties or claims for any patented invention, article, process or method that may be used upon or in a manner connected with the Work under this Contract or with the use of completed Work by City.

### **3.14 CONTRACTOR'S CERTIFICATION**

- A. Conflict of Interest
  - 1. The Contractor certifies (and shall require each Subcontractor to certify) that it has no direct or indirect pecuniary or proprietary interest, and that it shall not acquire any such interest, which conflicts in any manner or degree with the work, services or materials required to be performed and/or provided under this Contract and that it shall not employ any person or agent having any such interest. In the event that the Contractor or its agents, employees or representatives acquires such a conflict of interest, the Contractor shall immediately disclose such interest to City and take action immediately to eliminate the conflict or to withdraw from this Contract, as City may require.

**B. Contingent Fees and Gratuities**

1. The Contractor, by entering into this Contract with City to perform or provide work, service materials, has thereby covenanted:
  - a. That no person or selling agency except bona fide employees or designated agents or representatives of the Contractor has been or will be employed or retained to solicit or secure this Contract with an agreement or understanding that a commission, percentage, brokerage, or contingent fee may be paid; and
  - b. That no gratuities, in the form of entertainment, gifts or otherwise, have been or will be offered or given by the Contractor or any of its agents, employees or representatives, to any official member or employee of City or other governmental agency with a view toward securing this Contract or securing favorable treatment with respect to the awarding or amending thereof, or the making of any determination with respect to the performance of this Contract. The Contractor certifies that it has not made any contributions to any person or entity as a condition of doing business with City and it has disclosed to City all attempts by any person to solicit such payments.

**3.15 DEVIATION FROM CONTRACT**

- A. The Contractor shall not make an alteration, variation, addition, deviation, or omission from the requirements of the Contract Documents without the prior written consent of the Engineer.
- B. Any alteration, variation, addition, deviation, or omission by the Contractor shall not result in any extra compensation or extension of time.

**3.16 OPERATIONS, MATERIAL HANDLING, AND STORAGE AREAS**

- A. Temporary Buildings and Utilities
  1. Temporary buildings (including storage sheds, shops, and offices) and utilities may be erected by Contractor on the Site only with the consent of City and without expense to City. The temporary buildings and utilities shall remain the property of Contractor and shall be removed by the Contractor at its expense upon completion of the Work.
- B. Disposal/Removal of Materials
  1. The Contractor shall be responsible for compliance with all laws governing the storage and ultimate disposal of all materials and components. The Contractor shall provide City with a copy of all manifests and receipts evidencing proper disposal when required by City or applicable law.
- C. Protection and Care of Contractor's Materials and Equipment
  1. The Contractor shall be responsible for the proper care and protection of its materials and equipment delivered to the Site. Materials and equipment may be stored on the Site at the



Contractor's own risk and with prior written approval from City. When the Contractor uses any portion of the Site as a shop, the Contractor shall be responsible for any repairs, patching, or cleaning arising from such use and for obtaining any necessary permits to establish such shop or temporary storage facilities.

### **3.17 CONTRACTOR'S OVERALL RESPONSIBILITY FOR PROTECTION OF WORK, PROPERTY, AND PERSONS**

- A. The Contractor shall be responsible for conditions of the Site, including safety of all persons and property, during performance of the Work. The Contractor shall maintain the Site and perform the Work in a manner which meets all statutory and common law requirements or other specific contractual requirements for the provision of a safe place to work and which adequately protects the safety of all persons and property on or near the Site. This obligation shall apply continuously and shall not be limited to normal working hours. City's inspection of the Work or presence at the Site does not and shall not be construed to include review of the adequacy of the Contractor's safety measures in, on or near the site of the Work.
- B. The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs, including adequate safety training, in connection with the Work. The Contractor shall comply with all applicable laws, ordinances, rules, regulations and lawful orders of any public authority bearing on the safety of persons or property or their protection from damage, injury or loss.
- C. The Contractor shall protect and be responsible for any damage or loss to the Work or to the materials and equipment associated with the Work until the date of Substantial Completion. The Contractor remains responsible for any damage or loss caused directly or indirectly by the acts or omissions of the Contractor, Subcontractors, Suppliers, or third parties authorized or allowed on the Site by the Contractor until Final Acceptance.
- D. The Contractor shall also be solely and completely responsible for damages arising from the Work that affect property adjacent to the Site.
- E. The Contractor shall repair or replace without cost to City any damage or loss that may occur, except damages or loss caused by the acts or omissions of City.
- F. The Contractor shall erect and maintain adequate steel plates, signs, fencing, barricades, lights or security measures and persons to protect the Work until the Engineer authorizes in writing the removal of signs, fencing, barricades, lights or security measures.
- G. The Contractor shall conduct all operations with the least possible obstruction and inconvenience to the public. To disrupt public traffic as little as possible, the Contractor shall permit traffic to pass through the Project Site with the least possible inconvenience or delay. The Contractor shall maintain existing roads, streets, sidewalks and paths within the Project Site, keeping them open and in good, clean, safe condition at all times.

### **3.18 PROTECTION OF PERSONS**

- A. The Contractor shall take all reasonable precautions for the safety of all employees working on this Contract and all other persons who may be affected by such Work. The Contractor shall designate a responsible member of its organization at the Site whose duty shall be to manage and coordinate the safety programs and to prevent accidents of the Contractor and Subcontractors.
- B. Except as otherwise stated in the Contract, if the Contractor encounters, on the Site, material reasonably believed to be Hazardous Material that Contractor shall immediately stop work in the area affected and give Notice of the condition to City. Work in the affected area shall not be resumed without written direction by City.
- C. To protect the lives and health of persons performing work under this Contract, the Contractor shall comply with the Federal Occupational Safety and Health Act of 1970 (OSHA), including all revisions, amendments and regulations issued thereunder, and the provisions of the Washington Industrial Safety Act of 1973 (WISHA), including all revisions, amendments and regulations issued thereunder by the Washington State Department of Labor and Industries including, without limitation, all excavation, tunneling, trenching and ditching operations. In case of conflict between any such requirements, the more stringent regulation or requirement shall apply. There is no acceptable deviation from these safety requirements, regardless of practice in the construction industry. Any violation of OSHA, WISHA or other safety requirements applicable to the Work may be considered a breach of this Contract.

### **3.19 SAFETY PROGRAM**

- A. The Contractor shall prepare and maintain a written site specific "Safety Program" demonstrating the methods by which all applicable safety requirements of this Contract will be met. The Contractor shall ensure its Subcontractors and Suppliers have a written "Safety Program" or formally adopt the Contractor's site specific "Safety Program." The Contractor shall conduct a weekly safety meeting with all Subcontractors and others on the Site to discuss general and specific safety matters.

### **3.20 ARCHAEOLOGICAL AND HISTORICAL PRESERVATION**

- A. The Contractor shall comply fully with the requirements set forth in Chapter 27.53 RCW entitled Archaeological Sites and Resources. The Contractor shall immediately notify the City if any artifacts, skeletal remains or other archaeological resources (as defined under RCW 27.53.040 now and as hereinafter amended) are unearthed during excavation or otherwise discovered on the Site.

### **3.21 WATER POLLUTION CONTROL REQUIREMENTS**

- A. The Contractor shall comply with and be liable for all penalties, damages and violations under Chapter 90.48 RCW including any regulations issued pursuant thereto in the performance of the Work.

### **3.22 EASEMENTS**

- A. If the Contractor makes arrangements for use of additional public and/or private property, the Contractor, prior to using such property, shall provide the Engineer with written permission of the landowner, or duly authorized agent of such landowner, for such use.

### **3.23 TITLE VI / NONDISCRIMINATION ASSURANCES**

- A. During the performance of this contract, the contractor/consultant, for itself, its assignees and successors in interest (hereinafter referred to as the “contractor”) agrees as follows
  - 1. Compliance with Regulations: The contractor shall comply with the Regulations relative to non-discrimination in federally assisted programs of United States Department of Transportation (USDOT), Title 49, Code of Federal Regulations, part 21, as they may be amended from time to time, (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this contract.
  - 2. Non-discrimination: The contractor, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, sex, or national origin in the selection and retention of sub-contractors, including procurement of materials and leases of equipment. The contractor shall not participate either directly or indirectly in the discrimination prohibited by Section 21.5 of the Regulations, including employment practices when the contract covers a program set forth in Appendix B of the Regulations.
  - 3. Solicitations for Sub-contracts, Including Procurement of Materials and Equipment: In all solicitations either by competitive bidding or negotiations made by the contractor for work to be performed under a sub-contract, including procurement of materials or leases of equipment, each potential sub-contractor or supplier shall be notified by the contractor of the contractor’s obligations under this contract and the Regulations relative to non-discrimination on the grounds of race, color, sex, or national origin.
  - 4. Information and Reports: The contractor shall provide all information and reports required by the Regulations or directives issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the contracting agency or the appropriate federal agency to be pertinent to ascertain compliance with such Regulations, orders and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information, the contractor shall so certify to WSDOT or the USDOT as appropriate, and shall set forth what efforts it has made to obtain the information.
  - 5. Sanctions for Non-compliance: In the event of the contractor’s non-compliance with the non-discrimination provisions of this contract, the contracting agency shall impose such contract sanctions as it or the USDOT may determine to be appropriate, including, but not limited to:

6. Withholding of payments to the contractor under the contract until the contractor complies, and/or,
7. Cancellation, termination, or suspension of the contract, in whole or in part.
8. Incorporation of Provisions: The contractor shall include the provisions of paragraphs (1) through (5) in every sub-contract, including procurement of materials and leases of equipment, unless exempt by the Regulations, or directives issued pursuant thereto. The contractor shall take such action with respect to any sub-contractor or procurement as the contracting agency or USDOT may direct as a means of enforcing such provisions including sanctions for non-compliance. Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a sub-contractor or supplier as a result of such direction, the contractor may request WSDOT enter into such litigation to protect the interests of the state and, in addition, the contractor may request the USDOT enter into such litigation to protect the interests of the United States.

### **3.24 APPRENTICESHIP**

- A. For the period July 1, 2024, through June 30, 2026, applicable to all contracts where the engineer's estimate equals or exceeds \$2 million. For all contracts bid between July 1, 2026, through June 30, 2028, applicable to all contracts where the engineer's estimate equals or exceeds \$1.5 million. For all contracts bid after July 1, 2028, applicable to all contracts where the engineer's estimate equals or exceeds \$1 million.
- B. This Contract includes an Apprentice Utilization Requirement of 15 percent. This requirement establishes the minimum percentage of project Labor Hours that shall be performed by Apprentices, unless a different amount is permitted or otherwise required by law. The Contractor or subcontractor may not be required to exceed the apprenticeship utilization requirements of RCW 39.04.320.
- C. Reporting: The Contractor shall submit the "Apprentice Utilization Plan" and any "Good Faith Effort" documentation to the Engineer. The Engineer will verify the registration of all apprentices employed on the project with WSTAC and will monitor apprentice utilization data provided by the Contractor. The Engineer will make routine visits to the project site to confirm use of apprentices. When using the Washington State Department of Labor and Industry (L&I) online Prevailing Wage Intent & Affidavit (PWIA) system to submit payroll data, the Contractor shall also submit on a monthly basis all information requested on the Utilization tab. The Contractor shall complete the Report for itself and its subcontractors including all sections related to the use of small businesses, women, minority and other disadvantaged business enterprises, and demographic information for apprentices.
- D. Apprentice Utilization Plan: The Contractor shall submit an initial "Apprentice Utilization Plan" by filling out the Apprentice Utilization Plan Form within thirty (30) calendar days of Award of Contract or by the Preconstruction Meeting, whichever is sooner, demonstrating how and when they intend to achieve the Apprentice Utilization Requirement. The Plan shall be in sufficient detail for the Engineer to track

the Contractor's progress in meeting the utilization requirements and be updated and resubmitted as the Work progresses or when ordered by the Engineer. If the Contractor is unable to demonstrate ability to meet the Apprentice Utilization Requirement in their initial Apprentice Utilization Plan, the Contractor must also submit GFE documentation to the Engineer for review, comment, and approval with their Apprentice Utilization Plan. The Contractor shall actively seek out opportunities to meet the Apprentice Utilization Requirement during the construction Work. The Apprentice Utilization Plan shall be revised as more information becomes available or changes are experienced in such things as scope, subcontracting, apprentice availability, or project schedule.

E. Contacts: The Contractor may obtain information on State-approved Apprenticeship Training Programs by contacting the Department of Labor and Industries at:

1. Specialty Compliance and Services Division, Apprenticeship Section, P.O. Box 44530, Olympia, WA 98504-4530 or by phone at (360) 902-5320 or online at <https://lni.wa.gov/licensing-permits/apprenticeship/apprenticeship-preparation>

F. Compliance: In the event the Contractor is unable to achieve the Apprentice Utilization Requirement, the Contractor shall submit to the Engineer, GFE documentation for review and approval. The GFE documentation shall be submitted no later than thirty (30) days after Substantial Completion. If GFE documentation was previously submitted as part of the Apprentice Utilization Plan, it shall be updated and resubmitted no later than thirty (30) days after Substantial Completion.

G. Adjustment of Requirements: The Chief of Operations or designee may adjust the requirements of this Section 3.24 Apprenticeship, for the following reasons:

1. The demonstrated lack of availability of apprentices in specific geographic areas;
2. A disproportionately high ratio of material costs to labor hours, which does not make feasible the required minimum levels of apprentice participation;
3. Participating contractors have demonstrated a good faith effort (GFE) to comply with the requirements of RCW 39.04.320.

H. Good Faith Efforts:

1. The GFE shall describe in detail why the Contractor is not or was not able to attain the Apprentice Utilization Requirement. Emails, letters, or other written communications with letterhead, titles, and contact information are required. The GFE documentation shall address one or more of the following areas:
  - a. Demonstrated Lack of Availability of Apprentices. Correspondence from State-approved Apprenticeship Training Program(s), with project specific responses confirming there is a lack of availability of Apprentices for this project.

- b. Demonstrated Disproportionate Ratio of Material/Equipment/Products to Labor Hours: Documentation explaining the bid includes a disproportionate high cost of material/equipment/products to Labor Hours. (E.g., a \$2 M estimated contract includes \$1 M or more in procurement costs of equipment to be installed.)
  - c. Demonstrated Lack of Necessary Labor Hours. Correspondence from a State-approved Apprentice Training Programs confirming there is not enough time in the project to meet required journey level to apprentice training ratios.
  - d. Demonstrated Lack of Available Approved Programs: Correspondence from State-approved Apprentice Training Programs, confirming there are no programs that train for the scopes included/anticipated on the project. Contractor and state programs to submit training program detail needs and details that could be used for future program creation.
  - e. Funding Precedent: Documentation that shows conflicting, more restrictive, or precedent requirements for other training on the Project. Examples include, but are not limited to, Tribal Employment Rights (TERO), Federal Training Hours, or Special Training that affect the ability to use state-registered apprentices.
  - f. Warranty Work: Documentation from Original Equipment Manufacturers, or similar, confirming that work performed must only be completed by certified journey-level installers or risk voiding warranty, or similar.
  - g. Other Effort: The Contractor may submit other evidence, documentation, or rationale for not being able to achieve the required Apprentice Utilization that are not covered in the other efforts named. Other efforts will still need to be corroborated by an independent, knowledgeable third-party.
2. Documentation could be posters placed on site, emphasis in subcontracts about employing Apprentices, letters, memos or other correspondence from Contractor to subcontractor that put an emphasis on employing Apprentices.
  3. Contractors may receive a GFE credit for graduated Apprentice hours through the end of the calendar year for all projects worked on as long as the Apprentice remains continuously employed with the same Contractor they were working for when they graduated. If an Apprentice graduates during employment on a project of significant duration, they may be counted towards a GFE credit for up to one year after their graduation or until the end of the project (whichever comes first). Determination of whether or not Contract requirements were met in good faith will be made by subtracting the hours from the journeyman total reported hours for the project and adding them to the apprentice hour total. If the new utilization percentage meets the Contract requirement, the Contractor will be reported as meeting the requirement in good faith.

- I. Approving Good Faith Efforts: The Contracting Agency will review submitted Good Faith Efforts and issue a determination. The Chief of Operations or designee may request additional information, documentation, evidence or similar, in order to approve such efforts. A determination by the Chief of Operations or Designee is final. The approved Good Faith Efforts will be loaded into the PWIA system by the Contracting Agency.
- J. Payment:
  - 1. All costs incurred by the Contractor for complying with this specification shall be incidental and included in the Contract prices for the Bid items of Work involved.
  - 2. An incentive payment will be added to the final payment if the Apprentice Utilization Requirement of 15 percent met.
  - 3. A penalty will be deducted from the final payment if the project does not reach the Apprentice Utilization Requirement of 15 percent or adjusted requirement per a City approved GFE.

#### **PART 04 ADMINISTRATION OF THE CONTRACT**

##### **4.01 TIME OF ESSENCE**

- A. All time requirements set forth in the Contract Documents are of the essence.

##### **4.02 WORK PROGRESS**

- A. The Contractor shall be required to:
  - 1. Prosecute the Work diligently with adequate forces;
  - 2. Plan, coordinate, and layout the Work in advance so as to avoid delay; and
  - 3. Achieve Substantial Completion of the Work and Final Acceptance in accordance with the requirements of Contract Documents.

##### **4.03 SCHEDULE OF VALUES**

- A. Unless otherwise specified, within fourteen (14) calendar days after the date of Contract Execution, the Contractor shall submit to City a detailed Schedule of Values that identifies the various activities of the Work and their values and quantities, including the overhead and profit for each activity. The Contractor warrants that the values identified in its Schedule of Values accurately reflect the value of each work activity. The Schedule of Values shall be used as a basis for calculating all Progress Payments. Payment for Contract Work shall be made only for and in accordance with those activities identified in the Schedule of Values.
- B. The Contractor shall not be entitled to, nor shall City be required to make, payment for any Contract Work until the Schedule of Values has been accepted by City. Such acceptance shall not be unreasonably withheld.

- C. City shall review and accept the Schedule of Values or provide the Contractor with a written explanation of why the Schedule of Values was not acceptable. City shall use reasonable efforts to review the Schedule of Values within thirty (30) days of City's receipt of the Contractor's submittal of its Schedule of Values. City's acceptance of the Schedule of Values shall not relieve the Contractor from its sole responsibility for the accuracy of the Schedule of Values and its compliance with all Contract requirements. The Contractor shall revise the Schedule of Values as necessary to accurately reflect Change Orders.
- D. Each Application for Payment shall include a current status of the Schedule of Values. No Application for Payment will be considered until the current status of the Schedule of Values has been submitted and accepted.
- E. The activities, which the Contractor identifies within its Schedule of Values, shall be specifically referenced within, and conform and be consistent with the activities set forth within the Project Schedule.

#### **4.04 PROJECT SCHEDULE**

- A. Unless otherwise specified, within fourteen (14) days after the date of Contract Execution, the Contractor shall submit to City a Project Schedule. The Project Schedule shall show the sequence in which the Contractor proposes to perform the Work, indicate the Critical Path, identify the dates on which the Contractor proposes to start and finish the scheduled activities of the Contract Work, indicate Substantial Completion within the Contract Time, indicate a date for Final Acceptance, and meet all the requirements as may be set forth in the Contract Documents.
- B. Within thirty (30) days of City's receipt of the Contractor's submittal of its Project Schedule or unless stated elsewhere in the Contract, City shall review the Project Schedule and provide the Contractor with written comments. City will review the Project Schedule only to determine whether the Project Schedule meets the requirements in the Technical Specifications on Project Schedule. To the extent the Project Schedule does not meet such Technical Specifications, the Contractor shall revise the Project Schedule to make it compliant.
- C. By reviewing the Project Schedule and providing written comments, City is not approving or adopting the Contractor's plan, schedule, means, methods, techniques, sequences, or procedures required to perform the Work. Review and comment by City of the Project Schedule shall not relieve the Contractor from the sole responsibility for the accuracy of a Project Schedule, and its compliance with all Contract requirements, and its responsibility to meet all required Contract completion dates. Failure by City to indicate items on the Project Schedule that do not conform with the Contract requirements shall not alter or waive the Contract requirements or relieve the Contractor from complying with all Contract requirements.



- D. The Contractor shall not be entitled to, nor shall City be required to make payment for any Contract Work until the Project Schedule complies with all Contract requirements.
- E. The Contractor shall schedule the Contract Work so that the Contract Work is completed within the Contract Time. Float in the project Schedule shall be defined as the period of time measured by the number of days each non-critical path activity may be delayed before it and its succeeding activities become part of the Critical Path. Contractor and Owner may both utilize float to offset delays to the Work.
- F. The Contractor shall regularly enter the actual progress of the Work and Contract Time extensions, if any, approved by City on the Project Schedule. Updated Project Schedules shall reflect actual progress and completion within the Contract Time and shall be provided to City with each Application for Payment in format(s) as required by the Contract. Applications for Progress Payments will not be considered by City and the Contractor will not be paid until the Contractor complies with these requirements. The updated Project Schedule shall be used to assist City in verifying the appropriate payment.
- G. If, in the opinion of City, the Contractor falls behind in its progress of the Work due to acts or omissions of the Contractor, Subcontractors, and Suppliers, the Contractor shall take all necessary steps to improve its progress and bring its progress back in-line with the accepted Project Schedule, without additional cost to City. In this circumstance the Contractor shall, as necessary, increase the number of shifts, overtime operations, and/or days of work, both on and off the Site, and submit for acceptance any supplementary schedule or schedules as City deems necessary to demonstrate how the accepted rate of progress will be regained. Failure of the Contractor to comply with the requirements under these provisions shall be grounds for a determination by City that the Contractor is not prosecuting the Work with sufficient diligence to ensure completion within the time specified in the Contract. Upon making this determination, City may pursue any right it has under the law or the Contract, including but not limited to default termination.

#### **4.05 SUBMITTALS**

- A. Submittals include shop drawings, setting and erection drawings, schedules of materials, product data, samples, certificates and other information prepared for the Work by the Contractor or a Subcontractor as set forth in the Technical Specifications ("Submittals"). The Contractor shall perform no portion of the Work requiring Submittals until the Submittals have been reviewed and returned by City with one of the following annotations: (1) no exceptions taken, or (2) note markings.
- B. When submitting information, the Contractor shall identify and state reasons for any alteration, variation, addition, deviation, or omission from the Contract. The Contractor shall not perform work that alters, varies, adds to, deviates from, or omits any requirement of the Contract Documents without prior specific written acceptance by City.

- C. The Contractor shall provide Submittals with reasonable promptness and in such sequence as to facilitate the timely completion of the Contract.
- D. City shall review the Contractor's Submittals and respond in writing with reasonable promptness so as not to unreasonably delay the progress of the Work. Unless otherwise agreed, no delay to the Work shall be attributable to the failure by City to respond to a Submittal until thirty (30) days after the Submittal is received by City, and then only if failure by City to respond is unreasonable and affects the Contract completion date.
- E. If the Contractor is required to resubmit a Submittal, any revisions on resubmittals shall be specifically identified in writing and the resubmitted Submittal shall be sequentially alpha denoted (for example: 22A followed by 22B, etc.) and note revisions in numerical order. The cost of the review of the initial Submittal and the first revised submittal shall be borne by City. The costs of all additional revised Submittals shall be charged to the Contractor. The cost of review shall include, without limitation, administrative, design, and engineering activities directly related to review of Submittals. City may deduct these costs from any amounts due the Contractor.
- F. City shall review the Contractor's Submittals only for conformance with the design of the Work and compliance with the Contract. Review of the Submittals are not conducted to verify the accuracy of dimensions, quantities, or calculations, the performance of materials, systems, or equipment, or construction means, methods, techniques, sequences, or procedures, all of which remain the Contractor's responsibility. Failure by City to take exception to a Submittal shall not relieve the Contractor from any duty, including its responsibility for errors or omissions in Submittals, its duty to make Submittals and duty to perform the Work according to the requirements of the Contract. City's review of a Submittal shall not alter or waive the requirements of the Contract unless City has issued prior written approval of such change or alteration of the Contract requirements.
- G. The Contractor's failure to identify any error, deviation, or omission and subsequent acceptance of the Submittal by City shall not relieve the Contractor from complying with the Contract requirements.

#### **4.06 REQUESTS FOR INFORMATION**

- A. If the Contractor determines that some portion of the drawings, specifications or other Contract Documents require clarification or interpretation by City because of an apparent error, inconsistency, omission, or lack of clarity in the Contract, the Contractor shall promptly submit a Request For Information ("RFI") and, unless otherwise directed, shall not proceed with the affected work until City has responded to the RFI. The Contractor shall plan its work in an efficient manner so as to allow for timely responses to RFIs.
- B. City shall respond in writing with reasonable promptness to Contractor's RFI.
- C. At the request of the Engineer, the Contractor shall prioritize its RFIs, identify a date by which the Contractor prefers the RFI be answered, and reasons for such priority.

- D. If the Contractor submits a RFI on an activity less than thirty (30) days prior to the commencement of that activity, the Contractor shall not be entitled to any time extension or adjustment in Contract Price due to the time it takes City to respond to the RFI provided that City responds within fifteen (15) days. No delay to the Work or damages to the Contractor shall be attributable to the failure by City to respond to the RFI until fifteen (15) days after City's receipt of the RFI, and then only if the failure by City to respond is unreasonable and affects the Contract completion date.
- E. City's response to a RFI shall not be considered a change to the Contract requirements unless it is accompanied by a Request for Change Proposal. If the Contractor believes that City's response to the RFI constitutes changed work impacting Contract Price or Contract Time, the Contractor shall submit a Notice of Claim, Supplemental Information and a Request for Change Order to City in accordance with Part 5, Changes to the Contract.

#### **4.07 TESTS, INSPECTIONS, AND ACCESS TO THE WORK**

- A. Contractor shall be responsible for inspection and quality assurance of all the Work including all work performed by any Subcontractor. The Contractor shall document and 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. The Contractor shall maintain all documentation related to testing and inspection and make such documentation available to City at its request. Unless otherwise provided, Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to City, or with the appropriate public authority. If any governmental, regulatory, or permitting authority requires any portion of the Work to be inspected, tested, or approved, the Contractor shall make all arrangements for and cooperate with such inspections, tests, and approvals so as not to delay completion of the Work. The Contractor shall bear all related costs of tests, inspections, and approvals. The Contractor shall give City at least three (3) days' Notice of: (1) when the work is ready to be tested and inspected and (2) when and where tests and inspections are to be made. Contractor shall maintain complete inspection records and make them available to City upon request.
- B. The Contractor shall cooperate with City in the performance of any tests and inspections of the Work. The Contractor has the duty to coordinate all tests and inspections in a manner, which does not negatively impact Contractor's compliance with the Contract.
- C. If any Work required to be inspected, tested, or approved is covered without such inspection, testing or approval being obtained, it must, if requested by City, be uncovered for observation, and such uncovering shall be at Contractor's expense.
- D. City may, at any reasonable time and at its own cost, conduct inspections and tests as it deems necessary to ensure that the Work is in accordance with the Contract. City shall promptly notify Contractor if an inspection or test reveals that the Work is not in accordance with the Contract. City inspection and tests are for the sole benefit of City 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; or
  5. Impair City's right to reject defective or nonconforming items, or to avail itself of any other remedy to which it may be entitled.
- E. Neither observations by an inspector retained by City, 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. Inspectors are not authorized to change any term or condition of the Contract.
- F. 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 City. City 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 reinspection or retest necessary. City shall perform its inspections and tests in a manner that will cause no undue delay in the Work.

#### **4.08 CORRECTION OF WORK OR DAMAGED PROPERTY**

- A. If material, equipment, workmanship, or work proposed for, or incorporated into the Work, does not meet the Contract requirements or fails to perform satisfactorily, City shall have the right to reject such work by giving the Contractor written notice and may require the Contractor to promptly repair, replace or correct it at no cost to the City.
- B. If the Contractor does not repair, replace or correct and/or remove defective or non-conforming Work or repair damaged property as required by City, in manner and/or schedule, City or City's designee may repair, replace or correct and/or remove it and deduct the cost of such effort from any payment due the Contractor.
- C. If the remaining payments due the Contractor are not sufficient to cover City's cost of remedying the defective or non-conforming Work, the Contractor shall pay the difference to City.
- D. The Contractor shall be liable for all damages and costs incurred by City caused by defective or non-conforming work or workmanship, including but not limited to all special, incidental, or consequential damages incurred by City.

#### **4.09 SUBSTITUTION OF PRODUCTS & PROCESSES**

- A. Refer to 01 25 00 - Substitution Procedures.

- B. Substitutions requested by the Contractor will be subject to City's prior written acceptance and at City's sole discretion. The phrase "or approved equal" is not to be construed to mean that material or equipment will be approved as equal by the City.
- C. Requests for substitution must specifically identify:
  - 1. Material, equipment, and labor costs included in the Contractor's bid associated with the original item to be substituted;
  - 2. All costs for material, equipment, labor associated with the proposed substitution, including any impact costs;
  - 3. Proposed change to the Contract Price and/or Contract Time; and
  - 4. Compatibility with or modification to other systems, parts, equipment or components of the Project and Contract Work.
- D. Contractor shall provide all documentation supporting its request as requested by City.
- E. All costs of any redesign or modification to other systems, parts, equipment or components of the Project or Contract Work, which result from the substitution, shall be borne by the Contractor.
- F. When City approves a substitution proposed by the Contractor, the Contractor shall guarantee the substituted article or materials to be equal to, or better than, those originally specified and shall be compatible with all other systems, parts, equipment or components of the Project and Contract Work. City has the right to order an unaccepted, substituted article removed and replaced without additional cost to City.
- G. City has a right to a deductive Change Order if the substituted product or process is less costly than the contractually required product or process.
- H. If City does not accept the substitution proposal the Contractor shall proceed, without delay or cost to City, with the Contract Work as originally specified.
- I. No additional compensation or extension of time will be allowed to the Contractor for any changes required to adopt substitute material or equipment; therefore, the Contractor's Bid Proposal, including any approved substitutions, must include all costs for any modifications to the Work that may be necessary for approval and adaptation of the proposed substituted material or equipment.

#### **4.10 INCREASED OR DECREASED QUANTITIES**

- A. Payment to the Contractor will be made only for the actual quantities of work performed and accepted in conformance with the contract. When the accepted quantity of work performed under a unit item varies from the original proposal quantity, payment will be at the unit contract price for all work unless the total accepted quantity of any contract item, adjusted to exclude added or deleted amounts included in change orders accepted by both parties, increases or decreases by more than 25 percent

from the original proposal quantity. In that case, payment for contract work may be adjusted as described herein:

1. The adjusted final quantity shall be determined by starting with the final accepted quantity measured after all work under an item has been completed. From this amount, subtract any quantities included in additive change orders accepted by both parties. Then, to the resulting amount, add any quantities included in deductive change orders accepted by both parties. The final result of this calculation shall become the adjusted final quantity and the basis for comparison to the original proposal quantity.
  - a. Increased Quantities: Either party to the contract will be entitled to renegotiate the price for that portion of the adjusted final quantity in excess of 1.25 times the original proposal quantity. The price for excessive quantities will be determined by agreement of the parties, or, where the parties cannot agree, the price will be determined by the City based upon the actual costs to perform the work, including markup for overhead and profit in accordance with Paragraph 6.3, Allowable Costs.
  - b. Decreased Quantities: Either party to the contract will be entitled to an equitable adjustment if the adjusted final quantity of work performed is less than 75 percent of the original bid quantity. The equitable adjustment shall be based upon and limited to three factors:
    - i. Any increase or decrease in unit costs of labor, materials or equipment, utilized for work actually performed, resulting solely from the reduction in quantity;
    - ii. Changes in production rates or methods of performing work actually done to the extent that the nature of the work actually performed differs from the nature of the work included in the original plan; and
    - iii. An adjustment for the anticipated contribution to unavoidable fixed cost and overhead from the units representing the difference between the adjusted final quantity and 75% of the original plan quantity.
- B. The following limitations shall apply to renegotiated prices for increases and/or equitable adjustments for decreases:
  1. Labor, materials and equipment rates shall be actual costs but shall not exceed the rates set forth in Paragraph 6.3, Allowable Costs nor shall overhead and profit exceed the rates set forth in Paragraph 6.3, Allowable Costs.
  2. No payment for consequential damages or loss of anticipated profits will be allowed because of any variance in quantities from those originally shown in the proposal form, contract provisions, and contract plans.

3. The total payment (including the adjustment amount and unit prices for work performed) for any item which experiences an equitable adjustment for decreased quantity shall not exceed 75% of the amount original bid for the item.
- C. If the adjusted final quantity of any item does not vary from the quantity shown in the proposal by more than 25% then the Contractor and the City agree that all work under that item will be performed at the original contract unit price and within the original time for completion.
- D. When ordered by the Engineer, the Contractor shall proceed with the work pending determination of the cost or time adjustment for the variation in quantities.
- E. The Contractor and the City agree that there will be no cost adjustment for decreases if the City has entered the amount for the item in the proposal form only to provide a common proposal for bidders.

## **PART 05 CHANGES TO THE CONTRACT**

### **5.01 GENERAL**

- A. No provisions of the Contract may be amended or modified except by written agreement signed by the City.
- B. All Change Order work shall be performed in accordance with the original Contract requirements unless modified in writing by City.
- C. Any response to a Request For Information, or other directive, direction, instructions, interpretation, or determination (hereinafter referred to as "Direction" for the purposes of Article 5), provided by City is not considered a Change Order, a change to Contract requirements, and shall not constitute, in and of itself, entitlement to an adjustment in Contract Price and/or Contract Time.
- D. The Contractor shall not be entitled to any change in the Contract Price and/or Contract Time under the following conditions or events:
  1. They were reasonably foreseeable at the time the Contractor submitted its bid;
  2. They were caused by the acts of the Contractor, Subcontractor and/or Supplier, including but not limited to the choice of means, methods, techniques, sequences, or procedures for the Work, failure to provide labor, materials or equipment in a timely manner, and failure to take reasonable steps to mitigate delays, disruptions, or conditions encountered.
- E. The Contract requirements for time and price impacts related to Change Orders are set forth in Part 6, Time and Price Adjustments.
- F. If there is a bid item for "Minor Changes," payments or credits for changes that cost \$5,000 or less and do not affect time, may, at the discretion of the City, be made under that bid item in lieu of the procedures set forth in Sections 5.01-5.06. A Minor Change will be documented by a written Order for a Minor Change or by a notation confirming an oral agreement.

## **5.02 CONTRACTOR'S REQUEST FOR A CHANGE ORDER**

### **A. Notice of Claim and Supplemental Information.**

1. If the Contractor believes that it is entitled to additional compensation and/or time for any reason (other than for a differing site condition under Section 5.03, or if the Contractor disagrees with any written or oral direction, instruction, interpretation or determination from the City, the Contractor shall:
  - a. Provide the Engineer with a written Notice of Protest before doing any work or incurring any costs for which it may seek additional compensation or time from the City.
  - b. Supplement the written Notice of Protest within 14 days with a written statement that includes the following:
    - i. The date, circumstances, and basis of entitlement to additional compensation and/or time;
    - ii. The estimated dollar cost of the protested work and a detailed breakdown showing how that estimate was determined;
    - iii. An analysis of the progress schedule showing the schedule change or disruption if the Contractor is asserting a schedule change or disruption;
    - iv. Substantive basis of the Request;
    - v. If the protest is continuing, the information required above shall be supplemented upon request by the Engineer until the protest is resolved; and
    - vi. The Contractor waives all claims for additional compensation and time if it fails to provide both a timely Notice of Claim and Supplemental Information with the information required by this Section.

### **B. Request for Change Order.**

1. A Request for a Change Order must be submitted in writing to the Engineer no later than thirty-five (35) days after the Contractor submitted its supplemental information pursuant to Paragraph 5.1(A)(2).
2. The Request for a Change Order shall include:
  - a. Specific dollar amount covering all costs associated calculated in accordance with Part 6, Time and Price Adjustments;
  - b. Specific request for time extension (number of days) calculated in accordance with Part 6, Time and Price Adjustments;
  - c. A copy of the written Notice of intent, including all attachments;



- d. All documentation supporting the Request for a Change Order, including but not limited to a cost proposal prepared using the forms provided by City, all cost records, schedule analysis, and the documents identified in 3.09 Maintenance and Inspection of Documents, that are in any way relevant to the Contractor's Request for Change Order; and
  - e. The Contractor waives all claims for additional compensation and time if it fails to provide a timely Request for Change Order with the information required by this Section.
- C. City's Response to Contractor's Request for Change Order.
- 1. City will make a written determination with respect to the Contractor's Request for Change Order within thirty (30) days of receipt of said Request, unless one of the following activities occurs.
    - a. City may request additional information and specify a time period for receipt of the information. The Contractor shall comply with City's request for additional information.
    - b. City may inform the Contractor that additional time is needed to review the Contractor's Request for Change Order and identify a date certain when a decision will be rendered.
  - 2. If City requests additional information, City will make a written determination within thirty (30) days receipt of Contractor's additional information.
  - 3. If City does not make a determination within the applicable time period, the Request For Change Order is deemed denied.
- D. Approval of Request for Change Order and Execution of Change Order: If City determines that a Change Order is necessary, the parties may negotiate acceptable terms and conditions and execute a Bilateral Change Order or City may issue a Unilateral Change Order.
- E. Contractor Procedure upon Denial or Deemed Denial of a Request for a Change Order: If the Contractor disagrees with the denial, the Contractor's sole remedy shall be to file a fully documented Claim within thirty (30) days of deemed denial or the Contractor's receipt of the denial in accordance with Part 9, Claims and Litigation.
- F. Contractor's Obligation to Continue to Work: Pending resolution of the Contractor's Request for a Change Order, the Contractor shall continue to perform all Work including, at the written request of City that work associated with the pending Request for Change Order. The Contractor shall maintain its progress with the Work.
- G. Waiver: Failure to follow the provisions set forth herein shall constitute a waiver of the Contractor's right to receive any additional time or money as a result of any alleged direction, instruction, interpretation, determination by City and/or the event or impact to the Project.

### **5.03 DIFFERING SITE CONDITIONS**

- A. Immediate Written Notice to City. If the Contractor encounters a Differing Site Condition as defined in Part 1.0 the Contractor shall immediately, and before the conditions are disturbed, give written Notice to City of Differing Site Conditions.
- B. Request for Change Order based on Differing Site Condition. Unless otherwise agreed upon in writing by the Engineer, within forty-five (45) days of the Contractor's initial written notification of the Differing Site Condition to City, the Contractor shall provide a Request for Change Order that includes all elements required for such a request, including:
  - 1. A detailed description of the Differing Site Condition; and
  - 2. Substantive, contractual, and technical basis supporting the existence of the Differing Site Condition and its impacts.
- C. Waiver.
  - 1. If the Contractor's actions disturb the Site such that City or City's designee cannot adequately and fully investigate the alleged differing site condition, the Contractor waives its right to receive any additional time or money as a result of the Differing Site Condition.
  - 2. Failure by the Contractor to provide either (a) immediate Notice or (b) Request for Change Order shall constitute a waiver of the Contractor's right to receive any additional time or money as a result of the Differing Site Condition.
  - 3. The Contractor shall be responsible for any and all costs or damages incurred by City resulting from the Contractor's failure to provide appropriate notice and/or the Detailed Description and Request for Change Order.
- D. City's Response to the Differing Site Condition Request for Change Order: City shall investigate the alleged Differing Site Conditions and respond to the Differing Site Condition in accordance with the Request for Change Order procedures set forth above.
- E. Contractor's Obligation to Continue to Work: The Contractor shall not disturb the condition until receipt of written authorization from the Engineer that work can resume at the location of the alleged Differing Site Condition. The Contractor shall continue with performance of all other Work.

#### **5.04 SUSPENSION OF WORK**

- A. City Issues Directive Suspending Work
  - 1. City may order the Contractor, in writing, to suspend all or any part of the Work of this Contract for the period of time that City determines appropriate for the convenience of City. The Contractor shall not suspend the Work without written direction from City specifically authorizing the Suspension of Work.

2. Upon receipt of a written Notice suspending the Work, the Contractor shall immediately comply with its terms and take all reasonable steps to minimize costs attributable to such suspension. Within a period up to 120 days after the suspension notice is received by the Contractor, or within any extension of that period which City requires, City shall either:
    - a. Cancel the written notice suspending the Work; or
    - b. Terminate the Work for either default or convenience.
  3. If a written notice suspending the Work is canceled or the period of the Suspension or any extension thereof expires, the Contractor shall resume Work as required by City.
  4. If the performance of all or any part of the Work is, for an unreasonable period of time, suspended by the written direction of City, the Contractor may be entitled to an adjustment in the Contract Time, or Contract Price, or both, for increases in the time or cost of performance directly attributable to the suspension and provided that the Contractor sufficiently documents all costs and time impacts attributable to the suspension. No adjustments to Contract Price and/or Contract Time shall be allowed unless the Contractor can demonstrate that the period of suspension caused by City impacted Critical Path and delayed the Contractor from completing the Work on time.
- B. Constructive Suspension of Work: If the Contractor believes that some action or omission on the part of City constitutes constructive suspension of Work, the Contractor shall immediately notify City in writing that the Contractor considers the actions or omission a constructive suspension of Work.
- C. To the extent the Contractor believes it is entitled to any additional money or time as a result of the suspension of Work or constructive suspension, Contractor shall submit a Notice of Protest, Supplemental Information and Request for Change Order to City in accordance with Article 5, Changes to the Contract.
- D. Failure to comply with these requirements shall constitute a waiver of Contractor rights to any adjustment in Contract Time and/or Contract Price.
- E. No adjustment shall be made under this provision for any suspension to the extent that Contractor's performance would have been suspended, delayed, or interrupted as a result of actions, omissions, fault or negligence caused, in whole or in part, by the Contractor or any of its Subcontractors.

#### **5.05 FORCE MAJEURE**

- A. To the extent the Contractor believes it is entitled to any additional time as a result of Force Majeure, Contractor shall submit a Notice of Protest, Supplemental Information and Request for Change Order to City in accordance with Article 5, Changes to the Contract.
- B. Contractor shall not be entitled to a change in Contract Price resulting from an act of Force Majeure.

- C. Contractor is not entitled to an adjustment in Contract Time if the act of Force Majeure did not impact progress of the Work on the Critical Path and delay the Contractor from completing the Work within the Contract Time.
- D. When a Contractor experiences concurrent delay caused by either City or Contractor and an act of Force Majeure, the Contractor shall only be entitled to a change in Contract Time. No change to the Contract Price shall be allowed as a result of such concurrent delay.

## **5.06 CHANGE ORDERS**

- A. **Bilateral Change Orders:** If City and Contractor reach agreement on the terms and conditions of any change in the Work, including any adjustment in the Contract Price and Contract Time, such agreement shall be incorporated into a Change Order and signed by both Parties. Such Bilateral Change Orders shall represent full and complete payment and final settlement of all changes, Claims, damages or costs for all (a) time; (b) direct, indirect, and overhead costs; (c) profit; and (d) any and all costs or damages associated with delay, inconvenience, disruption of schedule, impact, ripple effect, loss of efficiency or productivity, acceleration of work, lost profits, stand-by, and any other costs or damages related to any work either covered or affected by the Change Order, or related to the events giving rise to the Bilateral Change Order.
- B. **Unilateral Change Order**
  - 1. **City's Right to Issue Unilateral Change Order.**
    - a. City may unilaterally issue a Change Order at any time, without invalidating the Contract and without notice to the sureties, making changes within the general scope of this Contract.
    - b. If any such Change Order causes an increase or decrease in the cost of, or time required for, performance of any part of the Work, City may make an adjustment in the Contract Price, Contract Time, or both, in accordance with Parts 5, Changes to the Contract, and 6, Time and Price Adjustments.
  - 2. **Contractor Disagreement with Unilateral Change Order.** If the Contractor disagrees with the adjustment to the Contract Price and/or Time as indicated in the Unilateral Change Order, the Contractor must submit a Notice of Protest, Supplemental Information and Request for Change Order to City in accordance with Article 5, Changes to the Contract.
  - 3. **Contractor's Obligation to Continue to Work.** The Contractor is required to continue with performance of all Work, including work associated with the Unilateral Change Order.

## **5.07 CITY REQUEST FOR A CHANGE PROPOSAL**

- A. **Request.** City may request a written Change Proposal from the Contractor for a change in the Work.

- B. Contractor's Proposal. Contractor shall submit its written Change Proposal within the time specified in City's request with the costs shown in a form acceptable to the City. The Change Proposal shall represent the Contractor's offer to perform the requested work, and the pricing set forth within the proposal shall represent full, complete, and final compensation for the proposed change and any impacts to any other Work, including any adjustments in the Contract Time.
- C. City's Acceptance of Contractor Proposal. If City accepts the Change Proposal as submitted by the Contractor or as negotiated by the parties, City shall notify the Contractor in writing of its acceptance of the Proposal and direct that the change in the Work be performed.
- D. Execution of a Bilateral Change Order. After acceptance of the Change Proposal or acceptance of the negotiated Change Proposal, City shall direct the Contractor to perform the work in accordance with the agreed upon terms; thereafter, the Parties shall execute a bilateral Change Order in accordance with the terms of the Change Proposal or negotiated Change Proposal.
- E. Execution of Unilateral Change Order. If City does not accept the Change Proposal or the Parties cannot agree upon the appropriate price or terms for the Change Proposal, City may issue a unilateral Change Order.

## **PART 06 TIME AND PRICE ADJUSTMENTS**

### **6.01 CHANGE IN THE CONTRACT TIME**

- A. The Contract Time shall only be changed by a Change Order.
- B. No change in the Contract Time shall be allowed to the extent the time of performance is changed due to the fault, act, or omission of Contractor, or anyone for whose acts or omissions the Contractor is responsible.
- C. Contractor is not entitled to a change in Contract Time unless the progress of the Work on the Critical Path is delayed and completion of the Contract Work within Contract Time is delayed.
- D. When a Contractor experiences concurrent delays which impact the Critical Path and are caused by (1) City and the Contractor; (2) City and an act of Force Majeure; or, (3) the Contractor and an act of Force Majeure, the Contractor shall only be entitled to a change in Contract Time. No change to the Contract Price shall be allowed as a result of such concurrent delay.
- E. A Request for Change Order that includes a request for an adjustment in the Contract Time shall:
  - 1. Be in writing and delivered to City within the appropriate time period specified in Part 5, Changes in the Contract.
  - 2. Include a clear explanation of how the event or conditions specifically impacted the Critical Path and overall Project Schedule and the amount of the adjustment in Contract Time requested.

3. Be limited to the change in the Critical Path of a Contractor's Project Schedule, and any updates, attributable to the event or conditions, which caused the request for adjustment. No extension of time or compensation for damages resulting from delay will be granted unless the delay affects the timely completion of all Work under the Contract or timely completion of a portion of the Work for which time of completion is specific. Contractor shall be responsible for showing clearly on the Project Schedule, and any updates, that the event or conditions:
  - a. Had a specific impact on the Critical Path and was the sole cause of such impact;
  - b. Could not have been avoided by resequencing of the Work or other reasonable alternatives; and
  - c. Will prevent the Contractor from completing the Project within the current Contract completion date.
- 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.

## **6.02 CHANGE IN THE CONTRACT PRICE**

- A. The Contract Price shall only be changed by a Change Order.
- B. No change in the Contract Price shall be allowed when:
  1. Contractor's changed cost of performance is due to the fault, acts, or omissions of Contractor, or anyone for whose acts or omissions Contractor is responsible, including its subcontractors and suppliers;
  2. The change is concurrently caused by Contractor and City; or
  3. The change is caused by an act of a third party or Force Majeure.
- C. City shall not be responsible for, and the Contractor shall not be entitled to any compensation for unallowable costs. Unallowable costs include, but are not limited to:
  1. Interest or attorney's fees of any type other than those mandated by Washington state statute;
  2. Claim preparation or filing costs;
  3. The cost of preparing or reviewing Change Proposals or Requests for Change Orders;
  4. Lost profits, lost income or earnings;
  5. Costs for idle equipment when such equipment is not at the Site, has not been employed in the Work, or is not scheduled to be used at the Site;
  6. Lost earnings or interest on unpaid retainage;
  7. Claims consulting costs;

8. The costs of corporate officers or staff visiting the Site or participating in meetings with City;
  9. Loss of other business; and/or
  10. Any other special, consequential, or incidental damages incurred by the Contractor, Subcontractor, or Suppliers.
- D. A Request for Change Order that includes a request for an adjustment in Contract Price shall:
1. Be in writing and delivered to City within the applicable time period specified in Part 5, Changes to the Contract.
  2. Identify the following information:
    - a. The event or condition which caused the Contractor to submit its request for an adjustment in the Contract Price;
    - b. The nature of the impacts to Contractor and its Subcontractors, if any; and
    - c. The amount of the adjustment in Contract Price requested calculated in accordance with Paragraph 6.3, Allowable Costs, and using forms provided by City.
  3. Any requests by Contractor for an adjustment in the Contract Price and in the Contract Time that arise out of the same event or conditions shall be submitted together.
- E. The adjustments to the Contract Price provided for in this Article represent full, final, and complete compensation for all work done in connection with the request for an adjustment in Contract Price and all costs related to, resulting from, or affected by such change in Work including, but not limited to, all direct and indirect costs, overhead, profit, and all costs or damages associated with delay, inconvenience, disruption of schedule, impact, dilution of supervision, inefficiency, ripple effect, loss of efficiency or productivity, acceleration of work, lost profits, and any other costs or damages related to any work either covered or affected by the change in the Work, or related to the events giving rise to the change.

#### **6.03 METHOD TO CALCULATE ADJUSTMENTS TO CONTRACT PRICE**

- A. One of the following methods shall be used to calculate damages and/or adjustments to the Contract Price that result from or relate to Change Proposal, Request for Change Order, and/or Claim.
- B. Determination of the method to be used to calculate adjustments in the Contract Price shall be at the sole discretion of City.
- C. One of the following methods shall be used:
  1. Unit Price Method;
  2. Firm Fixed Price Method (also known as Lump Sum); or

3. Time and Materials Method.

D. Unit Price Method

1. The City may direct the Contractor to perform extra work on a Unit Price basis. Such authorization shall clearly state the:
  - a. Scope of work to be performed;
  - b. Applicable Unit Price; and
  - c. Not to exceed amount of reimbursement as established by City.
2. The applicable unit price shall include reimbursement for all direct and indirect costs of the work, including Overhead and profit, as limited by paragraph 6.4, Allowable Costs.
3. Contractor shall only be paid under this method for the actual quantity of materials incorporated in or removed from the Work and such quantities must be supported by field measurement statements verified by City.

E. Firm Fixed Price Method

1. The Contractor and City may mutually agree on a fixed amount as the total compensation for the performance of changed work.
2. The Contractor shall provide a detailed cost breakdown supporting the Contractor's requested adjustment to Contract Price and any other financial documentation requested by the Engineer, as limited by paragraph 6.4, Allowable Costs.
3. Any adjustments to the Contract Price using the Firm Fixed Price Method shall include, when appropriate all reasonable costs for labor, equipment, material, Overhead and profit. Such labor, equipment, material, Overhead and profit shall be calculated in accordance with paragraph 6.4, Allowable Costs.
4. Whenever City authorizes Contractor to perform changed work on a Firm Fixed Price Method, City's authorization shall clearly state:
  - a. Scope of work to be performed; and
  - b. Total Fixed Price payment for performing such work.

F. Time and Materials Method

1. Whenever City authorizes the Contractor to perform work on a Time and Material basis, City's authorization shall clearly state:
  - a. Scope of work to be performed; and
  - b. A not to exceed amount of reimbursement as established by City.



2. Contractor shall:
  - a. Cooperate with City and assist in monitoring the work being performed;
  - b. Substantiate the labor hours, materials and equipment charged to work under the Time and Materials Method by detailed time cards or logs completed on a daily basis before the close of business each working day;
  - c. Present the timecard and/or log at the close of business each day to the Engineer so that City may review and initial each timecard/log;
  - d. Perform all work in accordance with this provision as efficiently as possible;
  - e. Not exceed any cost limit(s) without City's prior written approval; and
  - f. Maintain all records of the work, including all records of the Subcontractor, Supplier, and Materialmen, and make such records available for inspection as required in paragraphs 3.8, Record Documents, 3.9, Cost Records, and 3.10, Maintenance and Inspection of Document.
3. Contractor shall submit costs and any additional information requested by City to support Contractor's requested price adjustment.
4. The Contractor shall only be entitled to be paid for reasonable costs actually incurred by the Contractor. The Contractor has a duty to control costs. If City determines that the Contractor's costs are excessive or unreasonable, City, at its discretion, shall determine the reasonable amount for payment.

G. Deductive Changes to the Contract Price

1. A deductive change to the Contract Price may be determined by considering:
  - a. Costs incurred and saved by the Contractor as a result of the change, if any;
  - b. The costs of labor, material, equipment, and overhead saved and profit unearned by the deleted work. These costs shall be calculated following as closely as possible with the provisions identified in Part 6, Time and Price Adjustments; and/or,
  - c. At the discretion of City, costs set forth in the documents used by the Contractor to develop its bid.
2. Where City has elected not to correct incomplete or defective Work, the adjustment in the Contract Price shall take into account:
  - a. The costs the City would have to expend to correct the Work;
  - b. The decreased value to City resulting from the incomplete or defective Work; and,
  - c. The increased future costs which City may incur by reason of the incomplete or defective Work.

- H. Full Compensation: An adjustment calculated in accordance with the provisions of this Article shall be full and complete payment and final settlement of all changes, claims, damages and costs for all (a) time; (b) direct, indirect, and overhead costs; (c) profit; and (d) any and all costs or damages associated with delay, inconvenience, disruption of schedule, impact, ripple effect, loss of efficiency or productivity, acceleration of work, lost profits, standby, and/or any other costs or damages related to any Work either covered or affected by the changed Work, or related to the events giving rise to the change.

#### **6.04 ALLOWABLE COSTS**

- A. Any adjustments to the Contract Price shall be based on the following categories and shall incorporate markups for Overhead and profit as provided herein.
1. Labor. For all labor, including foreman supervision but excluding superintendents and other project management and consultants, the Contractor shall be reimbursed for labor costs provided herein. The labor cost of an event or condition shall be calculated as the sum of the following:
    - a. Labor Rate. The Labor Rate is the actual reasonable wage paid to the individual plus the actual reasonable costs incurred by the Contractor to cover costs associated with Federal Insurance Compensation Act (FICA), Federal Unemployment Tax Act (FUTA), State Unemployment Tax Act (SUCA), industrial insurance, fringe benefits, and benefits paid on behalf of labor by the Contractor. The applicable Labor Rates shall be multiplied by the number of hours reasonably expended in each labor classification because of the event or condition to arrive at a total cost of labor.
    - b. Travel Allowance and/or Subsistence. The labor calculation shall include the actual costs of travel and/or subsistence paid to the Contractor's employees engaged upon the Work when said payments are required by a labor agreement.
  2. Materials. The cost of materials resulting from an event or condition shall be calculated in one or more of the following methods, at City's election:
    - a. Invoice Cost. The Contractor may be paid the actual invoice cost of materials including actual freight and express charges and applicable taxes less all available discounts, rebates, and back-charges. This method shall be considered only to the extent the Contractor's invoice costs are reasonable and the Contractor provides copies of vendor invoices, freight and express bills, and other evidence of cost accounting and payment satisfactory to City. As to materials furnished from the Contractor's stocks for which an invoice is not available, the Contractor shall furnish an affidavit certifying its actual cost of such materials and such other information as City may reasonably require;

- b. Wholesale Price. The Contractor may be paid the lowest current wholesale price for which the materials are available in the quantities required, including customary costs of delivery and all applicable taxes less all available discounts, rebates, and back-charges; or
  - c. City Furnished Material. City reserves the right to furnish such materials as it deems advisable, and the Contractor shall have no Claim for any costs, Overhead or profit on such materials. However, should the Contractor be required to pick up, transport and/or unload such materials the Contractor will be reimbursed for reasonable costs thereof.
3. Equipment. The additional cost, if any, of machine-power tools and equipment usage shall be calculated in accordance with the following rules:
- a. Equipment Rates. The Contractor's own charge rates may be used if verified and approved by City and based on the Contractor's actual ownership and operating cost experience. Rental rates contained in published rate guides may be used if their cost formulas and rate factors are identifiable, reflect the Contractor's historical acquisition costs, utilization, and useful life, and do not include replacement cost, escalation contingency reserves, general and administrative expense, or profit. Rates shall be based on the Contractor's actual allowable costs incurred or the rates established according to the Rental Rate Blue Book for Construction Equipment, published by Equipment Watch, PRIMEDIA, whichever is less. The Rental Rate Blue Book established hourly equipment rate shall be the monthly rental rate for the equipment plus the monthly rental rate for required attachments, divided by 176 work hours per month, multiplied by the appropriate regional adjustment factor, plus the hourly operating cost. The established equipment rate shall apply for actual equipment usage up to eight hours per day. For all hours in excess of eight hours per day or 176 hours per month, the established equipment rate shall be the monthly rental rate plus the monthly rental rate for required attachments, divided by 352, multiplied by the regional adjustment factor, plus the hourly operating cost.
  - b. Transportation. If the necessary equipment is not already at the Site and it is not anticipated that it would be required for the performance of other work under the terms of the Contract, the calculation shall include a reasonable amount for the costs of the necessary transportation of such equipment.
  - c. Standby. The Contractor shall only be entitled to standby equipment costs if the equipment is ready, able, and available to do the Work at a moment's notice; (b) Contractor is required to have equipment standby because of an event or condition solely caused by City and (c) the Contractor can demonstrate that it could have and intended to use the equipment on other projects/jobs. The Contractor shall be compensated at 50% of the monthly rental rate for the equipment, divided by 176, and multiplied by the appropriate regional adjustment factor, as identified in the Rental Rate Blue Book for Construction Equipment, published by Machinery Information Division of PRIMEDIA Information Inc. Standby shall not be paid during periods of

Contractor-caused delay, concurrent delay, Force Majeure, during any seasonal shutdown, routine maintenance, down-time or broken equipment, late delivery of equipment or supplies, or other anticipated occurrence specified in the Contract Documents. No payment shall be made for standby on any piece of equipment, which has been used on the Project in any 24-hour period. Standby costs shall not be paid for weekends, holidays, and any time the equipment was not intended to be used on the Project as demonstrated by the Project Schedule.

4. Subcontractor & Supplier. Direct costs associated with Subcontractors and Suppliers shall exclude Overhead and Profit markups and shall be calculated and itemized in the same manner as prescribed herein for Contractor. Contractor shall provide detailed breakdown of Subcontractor and Supplier invoices.
5. Overhead and Profit Markup.
  - a. On a change to the Contract Price or any other claim for money by the Contractor, City will only pay Overhead, including Home Office Overhead, Site or Field Office Overhead, and unabsorbed home office overhead, and Profit pursuant to the Overhead and Profit Markups set forth herein. The Overhead and Profit Markups cover all overhead regardless of how the Contractor chooses to account for various costs in its books of account.
  - b. Overhead and Profit markups shall not be applied to freight, delivery charges, express charges, and sales tax.
  - c. The allowed Overhead and Profit markup shall not exceed the following:
    - i. If the Contractor is self-performing work: 18% combined Overhead and Profit markup on the Contractor's Direct Costs;
    - ii. If a Subcontractor or Supplier is performing work: 18% for the Subcontractor's Direct Cost for performing the work and 7% on the Direct Costs of the Subcontractors' or Suppliers'; provided that the 7% is to be divided among upper tier Subcontractors and the Contractor when a Subcontractor or Supplier is performing the work;
    - iii. If the value of material and equipment is greater than 50% of the total value of the change, the Overhead and Profit Markup shall only be 10% for material and equipment; and
    - iv. In no event shall the total combined Overhead and Profit markup for the Contractor and all Subcontractors and Suppliers of any tier exceed 25% of the Direct Cost to perform the Change Order work.

## **PART 07 PAYMENT AND COMPLETION**

### **7.01 APPLICATIONS FOR PAYMENT**

- A. Refer to 01 29 00 - Payment Procedures.
- B. On or about the first day of each month, the Contractor shall submit to City an Application for Payment. Each application shall be completed on a form acceptable to City and designated as an "Application for Payment."
- C. The Contractor is not entitled to payment for any work unless the Application for Payment includes all required documentation. City reserves the right to withhold payment pursuant to paragraph 7.2, Payments Withheld if it is subsequently determined that all required documentation was not provided by the Contractor or is in error.
- D. The application shall correlate the amount requested with the Schedule of Values and with the state of completion of the Work.
- E. The Contractor shall submit a breakdown of the cost of lump sum items to enable the Engineer to determine the Work performed on a monthly basis. Lump sum breakdowns shall be submitted prior to the first progress payment that includes payment for the Bid Item. Absent a lump sum breakdown, the Engineer will make a determination based on information available.

## **7.02 PAYMENTS**

- A. City shall comply with RCW 39.76, as amended, and promptly review each Application for Payment and identify in writing any cause for disapproval within 8 working days. In addition to withholding payment for unsatisfactory performance or failure to comply with Contract requirements, if the Contractor's Application for Payment fails to recognize any back-charges, off-sets, credits, change orders, or deductions in payment made in accordance with paragraph 7.3, Payments Withheld, City shall have the right to revise or disapprove Contractor's Application For Payment because the Application for Payment is not considered a properly completed invoice.
- B. The City shall withhold retainage from each Application for Payment as required by RCW 60.28, as amended.
- C. If an Application for Payment is accepted by City, it shall be paid within thirty (30) days of City's receipt of the properly prepared invoice (Application for Payment).

## **7.03 PAYMENT WITHHELD**

- A. In addition to retainage withheld pursuant to RCW 60.28 and without waiver of any other available remedies, City has the right to withhold, nullify, or back-charge, in whole or in part, any payment or payments due or that have been paid to the Contractor as may be necessary to cover City's costs or to protect City from loss or damage for reasons including but not limited to:
  - 1. Failure of the Contractor to submit or obtain acceptance of a Progress Schedule, Schedule of Values, and any updated Schedules;

2. Defective or non-conforming Work;
  3. Costs incurred by City to correct, repair or replace defective or non-conforming Work, or to complete the Work;
  4. A reasonable doubt that the Contract can be completed for the balance then unpaid;
  5. A reasonable concern by City that the materials, equipment or component parts are not in proper operating condition;
  6. Assessment of Liquidated Damages;
  7. Failure to perform in accordance with the Contract;
  8. Cost or liability that may occur to City as the result of the Contractor's or Subcontractor's acts, omissions, fault, or negligence;
  9. Deduction in the Work;
  10. Failure of Contractor to repair damaged materials, equipment, property, or Work;
  11. Failure of the Contractor to obtain approval of Submittals pertinent to the work accomplished;
  12. Failure to pay Subcontractors, Suppliers, employees or other obligations arising out of the Work;
  13. Failure to keep Record Documents up to date;
  14. Failure to comply with all applicable federal, state, and local laws, statutes, regulations, codes, licenses, easements, and permits;
  15. Failure to obtain and maintain applicable permits, insurance, and bonds; and
  16. Failure to provide Statement of intent to Pay Prevailing Wage and/or Affidavits of Wages Paid and, if requested, Certified Payroll Records for the Contractor and for Subcontractors of any tier.
- B. The withholding, nullification, or back-charge of any payment(s) by City shall in no way relieve the Contractor of any of its obligations under this Contract.

#### **7.04 TITLE**

- A. Title to all Work and materials covered by an accepted and paid Application For Payment shall pass to City at the time of such payment, free and clear of all liens, claims, security interest, and encumbrances. Passage of title shall not, however, (1) relieve Contractor from any of its duties and responsibilities for the Work or materials, including protection thereof, (2) waive any rights of City to insist on full compliance by Contractor with the Contract requirements, or (3) constitute acceptance of the Work or materials.

#### **7.05 SUBSTANTIAL COMPLETION**

- A. When the Contractor has achieved Substantial Completion (as defined in Section 1 above), the Contractor shall give written Notice to City.
  - 1. City shall promptly inspect the Work and prepare a Punch List (list of items to be completed or corrected).
    - a. City reserves the right to add to, modify, or change the Punch List.
    - b. Failure by City to include any items on such list does not alter the responsibility of the Contractor to complete or correct the Work in accordance with the Contract.
- B. At the Contractor's request, City may identify those Punch List items that must be completed or corrected in order for the Contractor to achieve Substantial Completion.
  - 1. When City determines that those Punch List items have been completed or corrected by the Contractor, City shall make a determination that the Work is Substantially Complete.
  - 2. A Certificate of Substantial Completion will be issued by City, which shall establish the date of Substantial Completion.
  - 3. This Certificate of Substantial Completion shall state the responsibilities of City and the Contractor for security, maintenance, heat, utilities, damage to the Work, and insurance.
- C. City shall assess liquidated damages for the Contractor's failure to Substantially Complete the Work within the Contract Time. The liquidated damage amounts, set forth elsewhere in the Contract Documents, will be assessed for Contractor's failure to achieve Substantial Completion within the Contract Time. These Liquidated Damages are not a penalty, but will be assessed against the Contractor for failure to achieve these Contract requirements. These Liquidated Damage amounts are fixed and agreed upon by and between the Contractor and City because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages City would in such events sustain. These amounts shall be construed as the actual amount of damages sustained by City, and may be retained by City and deducted from payments to the Contractor. Assessment of Liquidated Damages shall not release the Contractor from any further obligations or duties pursuant to the Work.
- D. As provided in the Contract Documents, City may grant Substantial Completion to specific subsystems or portions of the Work. The dates of Substantial Completion shall be determined, in writing, by City.

## **7.06 FINAL INSPECTION**

- A. The Contractor shall correct all remaining Punch List items and complete all remaining Work within the time period stated in the Certificate of Substantial Completion or within 30 days, whichever is less. When all Punch List items have been successfully corrected and the work is complete the Contractor's shall give written notice to the City that the Work ready for final inspection. After verification by City that such completion was satisfactory, the Contractor shall submit a Final Application for Payment.

## **7.07 REQUIREMENTS FOR FINAL APPLICATION FOR PAYMENT**

- A. In addition to any other requirement identified in the Contract Documents, the Final Application for Payment shall include the following documents:
  - 1. Affidavit of Wages Paid for Contractor and all Subcontractors in accordance with state law;
  - 2. Contractor's release of claims against City, except for Claims specifically described in the release document and submitted in accordance with Article 9, Claims and Litigation; and
  - 3. Contractor certification that all Subcontractors and Suppliers have been paid and there are no outstanding liens.

## **7.08 COMPLETION/FINAL ACCEPTANCE**

- A. Completion/Final Acceptance shall be achieved when all the obligations of the Contract have been successfully performed by the Contractor in accordance with the Contract and accepted by City. Should Contractor fail to achieve Final Acceptance within the required time the City may assess actual damages caused by its failure to do so.
- B. Neither Final Acceptance, nor Final Payment, shall release Contractor or its sureties from any obligations under this Contract or the Performance and Payment Bonds, or constitute a waiver of any claims by City arising from or related to Contractor's performance or failure to perform the Work and to meet all Contractual obligations in accordance with the Contract, including but not limited to:
  - 1. Unsettled liens, security interests or encumbrances;
  - 2. Damaged, non-conforming, or defective Work discovered by City;
  - 3. Terms of any warranties or guarantees required by the Contract; and
  - 4. Payments made in error.
- C. Except for any Claims properly submitted in accordance with Article 9, Claims and Litigation, acceptance of Payment on the Final Application for Payment by the Contractor shall, on behalf of itself and its Subcontractors or Sureties, forever and unconditionally release and discharge City, its officers, agents, employees, from:
  - 1. Any and all disputes or claims, including but not limited to claims for damages, fines, interest, taxes, attorney fees, or costs, demands, rights, actions or causes of actions, known or unknown, arising out of or in any way related to the parties' performance under the Contract and/or Project; and
  - 2. Any and all known and/or unknown liabilities, obligations, demands, actions, suits, debts, charges, causes of action, requests for money and/or payment under the Contract, outstanding invoices, or claims directly or indirectly arising out of or related to the Contract and/or Project.



## **7.09 WARRANTY AND GUARANTY**

- A. In addition to any special warranties provided elsewhere in the Contract, Contractor warrants that all Work conforms to the requirements of the Contract and is free from any defect in equipment, material, design, or workmanship performed by Contractor or its Subcontractors and Suppliers.
- B. The warranty period shall be for the longer period of one year from the date of Final Acceptance of the entire Project or the duration of any special extended warranty offered by a supplier or common to the trade.
- C. With respect to all warranties, express or implied, for Work performed or materials furnished according to the Contract, Contractor shall:
  - 1. Obtain all warranties that would be given in normal commercial practice from the supplier and/or manufacturer;
  - 2. Prior to Final Acceptance require all warranties be executed, in writing, for the benefit of City;
  - 3. Enforce all warranties for the benefit of City; and
  - 4. Be responsible to enforce any warranty of a Subcontractor, manufacturer, or Supplier, should they extend beyond the period specified in the Contract.
- D. If, within an applicable warranty period, any part of the Work is found not to conform to the Contract, the Contractor shall correct it promptly after receipt of written Notice from City to do so. In the event City determines that Contractor corrective action is not satisfactory and/or timely performed, then City has the right to either correct the problem itself or procure the necessary services, recommendations, or guidance from third parties. All damages incurred by City and all costs for City's remedy shall be reimbursed by the Contractor.
- E. The warranty provided in this provision shall be in addition to any other rights or remedies provided elsewhere in the Contract or by applicable law.

## **7.10 PRIOR OCCUPATION**

- A. City shall have the right to occupy such part or parts of the Project in or upon which the Work is being done, as it may see fit, and such occupation shall not be construed as acceptance by City of the Work or constitute Substantial Completion of the Work.

## **PART 08 TERMINATION**

### **8.01 CITY'S RIGHT TO TERMINATE CONTRACT**

- A. Termination for Default
  - 1. City may terminate, without prejudice to any right or remedy of City the Work, or any part of it, for cause upon the occurrence of any one or more of the following events:

- a. Contractor fails to prosecute the Work or any portion thereof with sufficient diligence to ensure Substantial Completion of the Work within the Contract Time;
  - b. Contractor fails to prosecute the Work or any portion thereof with sufficient diligence to ensure Final Acceptance of the Work in a timely manner;
  - c. Contractor is adjudged bankrupt, makes a general assignment for the benefit of its creditors, or a receiver is appointed on account of its insolvency;
  - d. Contractor fails in a material way to repair, replace or correct Work not in conformance with the Contract;
  - e. Contractor repeatedly fails to supply skilled workers or proper materials or equipment;
  - f. Contractor repeatedly fails to make prompt payment to its employees or Subcontractors;
  - g. Contractor materially disregards or fails to comply with laws, ordinances, rules, regulations, permits, easements or orders of any public authority having jurisdiction;
  - h. Contractor fails to comply with all Contract safety requirements; or
  - i. Contractor is otherwise in material breach of any provision of the Contract, including but not limited to quality control, environmental requirements, administrative requirements, coordination and supervision.
2. If City reasonably believes that one of the aforementioned events has occurred, City will provide the Contractor with written Notice of its intent to terminate the Contractor for default, specifying within such notice the ground(s) for such termination. City, at its option, shall require the Contractor to either promptly correct the deficiencies noted in City's intent to terminate or provide City with a corrective action plan as to how such deficiencies will be remedied or cured in a timely fashion. However, if after receipt of the proposed remedy, City has a reasonable basis for concluding that the Contractor has (a) failed or is unwilling to repair, replace or correct the deficiencies, or (b) failed or is unwilling to provide a reasonable and satisfactory corrective action plan, City shall thereafter have the right to terminate this Contract for default.
3. Upon termination, City may at its option:
  - a. Take possession of the Site and possession of or use of all materials, equipment, tools, and construction equipment and machinery thereon owned by Contractor; and/or
  - b. Finish the Work by whatever other reasonable method it deems expedient; or
  - c. Call upon the surety to perform its obligations under the performance and payment bonds, if applicable.

4. The Contractor and its sureties shall be liable for all damages and costs, including but not limited to: (1) compensation for architect and engineering services and expenses made necessary thereby; (2) any other costs or damages incurred by City in completing and/or correcting the Work; and (3) any other special, incidental or consequential damages incurred by City which results or arises from the breach or termination for default.
5. In the event of termination for default City shall only pay the Contractor for Work successfully completed and accepted by City prior to the date of termination. City shall not be responsible for any other Contractor costs, expenses, or damages including any consequential, special, or incidental damages or lost profits associated with this Contract. In no event shall City reimburse the Contractor for any costs directly or indirectly related to the cause of this termination for default.
6. If, after termination for default, it is determined that the Contractor was not in default, the rights and obligations of the parties will be the same as if the termination had been issued for the convenience of City.
7. The rights and remedies of City in this provision are in addition to any other rights and remedies provided by law or under this contract.

B. Termination for Convenience

1. Upon written Notice City may terminate the Work, or any part of it, without prejudice to any right or remedy of City, for the convenience of City.
2. If City terminates the Work or any portion thereof for convenience, Contractor shall recover as its sole remedy:
  - a. Reasonable costs for all Work completed prior to the effective date of the termination and not previously paid for by City; and
  - b. A reasonable allowance for Overhead and profit for Work actually performed prior to the date of termination and accepted by City, at a rate not to exceed the percentage amount set forth in the Contract and in paragraph 6.3, Allowable Costs, subparagraph A.5, Overhead and Profit. The Contractor waives all other claims for payment and damages including without limitation, anticipated profit and overhead on work not performed and accepted by City.
  - c. The Contractor shall not be entitled to any other costs or damages, whatsoever. The total sum payable upon termination shall not exceed the Contract Price reduced by prior payments. Contractor shall be required to make its request for adjustment in accordance with Article 5, Changes to the Contract, and Article 6, Time and Price Adjustments.
  - d. If it appears that the Contractor would have sustained a loss on the entire Contract had it been completed, City shall not reimburse Contractor any profit for the Work completed and shall reduce the settlement to reflect the indicated rate of loss.

**C. Contractor's Obligations During Termination**

1. Unless City directs otherwise, after receipt of a written Notice of termination for default or termination for convenience, Contractor shall promptly:
  - a. Stop performing Work on the date and as specified in the Notice of termination;
  - b. 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 not terminated;
  - c. Cancel all orders and subcontracts, upon terms acceptable to City, to the extent that they relate to the performance of Work terminated;
  - d. Assign as specifically requested by City all of the rights, title, and interest of Contractor in all orders and subcontracts;
  - e. Take such action as may be necessary or as directed by City to preserve and protect the Work, Site, and any other property related to this Project in the possession of Contractor in which City has an interest;
  - f. Continue performance of Work only to the extent not terminated; and
  - g. Take any other steps required by City with respect to this Project.

**8.02 CITY'S RIGHT TO STOP THE WORK FOR CAUSE**

- A. If Contractor fails or refuses to perform its obligations in accordance with the Contract, City 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 any adjustment in the Contract Time and/or Contract Price for any increased cost or time of performance attributable to Contractor's failure or refusal to perform its obligations under the Contract.

**PART 09 CLAIMS AND LITIGATION**

**9.01 CONTRACTOR CLAIMS**

- A. The following actions are a condition precedent to filing a Claim:
  1. The Contractor submitted a timely Notice of Protest, Supplemental Information and Request for Change Order as required by paragraph 5.1;
  2. The Request for Change Order has been denied or deemed denied by City; or
  3. A Unilateral Change Order is issued by City.
- B. Failure to file a Timely Claim.

1. At least seven (7) days prior to appropriate time to file a Claim, the Contractor may request an extension of time for filing its Claim. The Contractor shall state the reasons for the request and identify a date certain when the Contractor shall provide a fully documented Claim. Unless otherwise agreed to in writing by the Engineer, a fully documented Claim shall be received by the City within thirty (30) days after:
  - a. Denial or deemed denial of a Request for Change Order; or
  - b. Contractor's receipt of an Executed Unilateral Change Order.
2. Failure to comply with the time requirements set for filing a Claim shall constitute acceptance by the Contractor, on behalf of itself and its Subcontractors and Suppliers, of the Unilateral Change Order and/or City's denial or deemed denial of a Request for Change Order. Such acceptance shall be considered complete, full, and final settlement of all costs, damages, and Claims related to or arising from the Request for Change Order and/or Unilateral Change Order.
- C. Contractor's Obligation to Continue to Work: Pending final decision of a Claim hereunder, the Contractor shall proceed diligently with the performance of the Contract Work, including that work associated with the Claim, and maintain its progress with the Work.
- D. Information required in a Fully Documented Claim: Every Claim must be submitted by the Contractor, in writing and clearly designated by the Contractor as a fully documented Claim. At a minimum, a fully documented Claim must contain the following information:
  1. A detailed factual statement of the Claim providing all necessary details, locations, and items of Contract Work affected;
  2. The date on which facts arose that gave rise to the Claim;
  3. The name of each person employed or associated with the Contractor, Subcontractor, Supplier, and/or City with knowledge about the event or condition which gave rise to the Claim;
  4. Copies of documents and a written description of the substance of any oral communications that concern or relate to the Claim;
  5. The specific provisions of the Contract Documents on which the Claim is based;
  6. If an adjustment in the Contract Price is sought, the exact amount sought, calculated in accordance with the Contract including paragraph 6.3, Allowable Cost and accompanied by (a) all records supporting the Claim and (b) all records meeting the requirements of paragraph 3.10, Cost Records;
  7. If an adjustment in the Contract Time is sought, the specific days and dates for which it is sought; the specific reason the Contractor believes an adjustment in the Contract Time should be granted; and the Contractor's analyses of its Progress Schedule, any specific Schedule analysis as required by

the Contract Documents, and all updates to demonstrate the reason for the adjustment in Contract Time; and

8. A statement certifying, under penalty of perjury, that after the exercise or reasonable diligence and investigation the Claim is made in good faith, that the supporting cost and pricing data are true and accurate to the best of the Contractor's knowledge and belief, that the Claim is fully supported by the accompanying data, and that the amount requested accurately reflects the adjustment in the Contract Price or Contract Time for which the Contractor believes City is liable.
- E. Contractor's Duty to Cooperate: The Contractor shall cooperate with City or its designee in the evaluation of its Claim and provide all information and documentation requested by City, its auditors or its designee.
- F. City's Evaluation of the Claim
1. To assist City in the review of the Contractor's Claim, City or its designee may visit the Site, request additional information and/or documentation in order to fully evaluate the issues raised in the Claim and/or audit the Claim.
  2. After the Contractor has submitted a fully documented Claim that complies with this provision, City shall respond, in writing, to the Contractor within sixty (60) days from the date the fully documented Claim is received with either:
    - a. A decision regarding the Claim; or
    - b. Written Notice extending for another thirty (30) days City's time to respond to the Claim.
  3. Absent a thirty (30) day extension, the Claim shall be deemed denied upon the sixty-first (61st) day following receipt of the Claim by City. If City had a thirty (30) day extension, the Claim shall be deemed denied upon the ninety-first (91st) day following receipt of the Claim by City.

## **9.02 CONTRACTOR'S BURDEN OF PROOF ON CLAIM**

- A. The Contractor shall have the burden of proof to demonstrate entitlement and damages.
- B. If the Contractor, on behalf of itself or its Subcontractors and Suppliers seeks an adjustment in the Contract Price or Contract Time not supported by Project cost records meeting the requirements of paragraph 3.8, Cost Records, the Claim is waived.
- C. Compliance with the record keeping requirements set forth in this Contract is a condition precedent to recovery of any costs or damages related to or arising from performance of the Contract Work. If City establishes non-compliance of the record-keeping requirement set forth in paragraph 3.8, Cost Records, no adjustment shall be made to the Contract Price and/or Contract Time with respect to that Claim.

## **9.03 LITIGATION**

- A. As a mandatory condition precedent to the initiation of litigation by the Contractor against City, Contractor shall comply with all provisions set forth in this Contract including those stated in Part 5 and Part 9.
- B. Any litigation brought against City shall be filed and served on City within 365 days from either the issuance of the Certificate of Substantial Completion for the entire Contract or Final Acceptance if no Certificate of Substantial Completion of the entire Contract is issued.
- C. Venue and jurisdiction shall vest solely in the King County Superior Court.
- D. Failure to comply with these mandatory condition time requirements shall constitute a waiver of the Contractor's right to pursue judicial relief from or against the City.

## **PART 10 MISCELLANEOUS**

### **10.01 COMPENSATION, WAGES, BENEFITS AND TAXES**

- A. City assumes no responsibility for the payment of any compensation, wages, benefits, or taxes owed by the Contractor by reason of this Contract. The Contractor shall indemnify and hold City, its elected officials, officers, agents and employees, harmless against all liability and costs resulting from the Contractor's failure to pay any compensation, wages, benefits or taxes.

### **10.02 PREVAILING WAGES**

- A. Refer to [00 73 43 - INSTRUCTIONS FOR PREVAILING WAGE REQUIREMENTS.](#)
- B. The Contractor shall comply with the minimum wage requirements of RCW 39.12, as amended, including the obligation to pay at least the hourly minimum wage and fringe benefits to workers as required by RCW 39.12. The Contractor shall also post all notices required by the Washington Department of Labor & Industries on forms provided by the Department of Labor & Industries. The Contractor shall timely provide a "Statement of Intent to Pay Prevailing Wages" and timely provide an "Affidavit of Prevailing Wages Paid."

### **10.03 ALLOWANCES**

- A. Any Allowances stated in the Contract Documents shall be included in the Contract Sum. Items covered by Allowances shall be supplied for such amounts and by such persons or entities as Owner may direct, but Contractor shall not be required to employ persons or entities to whom Contractor has made reasonable and timely objection. Owner shall select materials and equipment under an Allowance with reasonable promptness. Allowances shall cover the net cost to Contractor of materials and equipment delivered and/or installed at the site, as identified in the Allowance, and all required taxes, less applicable trade discounts. Whenever actual costs are more than or less than Allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect the difference between actual, reasonable costs and the Allowances.

#### **10.04 SUCCESSORS AND ASSIGNS**

- A. City and the Contractor each binds itself, its partners, successors, assigns and legal representatives to the other with respect to all covenants, agreements and obligations contained in the Contract. Neither party to the Contract shall assign the Contract or sublet it as a whole without the written consent of the other, nor shall the Contractor assign any moneys due or to become due to it hereunder, without the previous written consent of City.

#### **10.05 THIRD PARTY AGREEMENTS**

- A. Except as otherwise may be provided, the Contract shall not be construed to create a contractual relationship of any kind between: any architect, engineer, construction manager, Subcontractor, Supplier, or any persons other than City and Contractor.

#### **10.06 NONWAIVER OF BREACH**

- A. No action or failure to act by City shall constitute a waiver of any right or duty afforded to City under the Contract; nor shall any such action or failure to act by City constitute an approval of or acquiescence in any breach hereunder, except as may be specifically stated by City in writing.

#### **10.07 NOTICE TO CITY 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, Contractor shall immediately give Notice, including all relevant information, to City.
- B. Contractor agrees to 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 any actual or potential labor dispute, all Subcontractor or lower-tiered Subcontractor shall immediately notify the next higher tier Subcontractor. Subcontractor or Contractor, as the case may be, of all relevant information concerning the dispute.

#### **10.08 HEADINGS**

- A. The headings used in the Contract are for convenience only and shall not be considered a part of or affect the construction or interpretation of any contractual provision therein.

#### **10.09 CHOICE OF LAW**

- A. In the event that either party shall bring a lawsuit or action related to or arising out of this Contract, such lawsuit or action shall be brought in the Superior Court, King County, Washington. This Contract shall be governed by, and construed and enforced in accordance with the laws of the State of Washington.

#### **10.10 SEVERABILITY**



- A. The provisions of this Contract shall be effective in all cases unless otherwise prohibited by Washington State Law or applicable Federal Law. The provisions of this Contract are separate and severable. The invalidity of any sentence, paragraph, provision, section, Article, or portion of this Contract shall not affect the validity of the remainder of this Contract.
- B. Failure to execute the Contract within ten (10) calendar days of notice of the Award of Bid will result in the Bidder's forfeiture of its Bid Bond or deposit as liquidated damages, not as a penalty. If this occurs, the City may then award the Project to the next lowest responsive, responsible Bidder or reject any or all Bids.

#### **10.11 MEANS AND METHODS**

- A. The means and methods adopted by the Contractor shall be such as will secure a satisfactory quality of Work and will enable the Contractor to complete the Work in the time agreed upon. The selection and use of these means and methods are the responsibility of the Contractor.

#### **10.12 EQUIPMENT AND MATERIALS SPECIFIED**

- A. Within these Contract Documents, certain items are specified by brand, style, trade name, or manufacturer in order to set forth a standard of quality, and/or preference by the City. It is not the intent of these Contract Documents to exclude other equipment or materials of a type and quality equal to those designated. Refer to 01 25 00 - Substitution Procedures for additional information. The phrase "or approved equal" is not to be construed to mean that material or equipment will be approved as equal by the City. Such approval will not be effective unless and until the item has been specifically approved in advance and in writing by the City. No additional compensation or extension of time will be allowed to the Contractor for any changes required to adopt substitute material or equipment; therefore, the Contractor's Bid Proposal, including any approved substitutions, must include all costs for any modifications to the Work that may be necessary for approval and adaptation of the proposed

**END OF SECTION**

**00 73 18 HEALTH AND SAFETY REQUIREMENTS****PART 1 GENERAL****1.01 SUMMARY**

- A. This Section includes requirements for health and safety procedures.
- B. The Contractor shall have the sole responsibility for safety, efficiency, and adequacy of the Contractor's appliances and methods, and for any damage or injury resulting from their failure, or improper maintenance, use, or operation. The Contractor shall be solely and completely responsible for the conditions of the Project Site, including safety of all persons and property in performance of the Work. These requirements shall apply continuously, and are not limited to normal working hours. Nothing the Owner may do, or fail to do, with respect to safety in the performance of the Work shall relieve the Contractor of this responsibility.
- C. The Contractor is responsible for accident prevention and job site safety. This responsibility cannot be delegated to subcontractors, suppliers, the Owner, or other Persons.

**1.02 PRELIMINARY WORK**

- A. Prior to the start of and during the course of the Work (above and below ground) the Contractor shall make a thorough survey of the entire worksite to determine all potential hazards and notify the City in writing of any such hazards prior to the commencement of work, or within **five (5) calendar days**, whichever comes first. Workers shall be made aware of those hazards and shall be instructed in procedures and the use of equipment for their protection. The Contractor shall verify the location and condition ("live" or "dead") of all utilities on and near the worksite and take precautions to protect their employees, the general public, and the property.

**1.03 WASTE MATERIAL**

- A. Contractor shall comply with all Federal, State, and Local environmental health rules and regulations. The Contractor, at the Contractor's expense, shall dispose of all refuse and waste material found on the site and generated by the Contractor in a legal disposal site. The Contractor shall immediately clean up any spilled material from the City's property and adjacent roads.
- B. The City does not provide a waste site for this project. The Contractor is responsible for legal disposal of all waste materials.

**1.04 HAZARDOUS AND TOXIC SUBSTANCES**

- A. Disposal of hazardous and toxic substances to comply with Chapter 70A.300 RCW - Hazardous Waste Management. Provide documentation or certification of compliance.
- B. Substances of any kind, including solids, flammable or explosive materials, odorous substances, toxic vapor, corrosive substances, slurry material, or excessive wastes may not be disposed into the City's

sewage system and must be disposed off site per all applicable laws and regulations at the expense of the Contractor.

- C. Toxic Waste Materials: Material removed from any sewage utility which has contact with the raw sewage or vapors is considered toxic waste material and must be disposed of in a proper manner as outlined by the State. This material may not be disposed of in the City.
- D. Upon encountering asbestos or materials suspected of containing asbestos, the Contractor shall stop work in the subject area and not remove, cut, or repair said material, nor may the Contractor enter or work in any area suspected of containing asbestos with damaged covering material, until so directed by the City or as specified by the Contract. The Contractor shall make every effort to minimize the impact of any disruption or stoppage of work, and promptly notify the City's Representative.
- E. All personnel working in direct contact with soil shall have current 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) certification. Contractor shall provide supervisory personnel with current 40-hour HAZWOPER and 8-hour HAZWOPER Supervisor certifications.

#### **1.05 EXISTING MANHOLES, VALVE BOXES AND MONUMENT CASES**

- A. The Contractor is responsible for adjusting all facilities to finished pavement grade. The Contractor is responsible for coordinating this work with the utilities involved.

#### **1.06 IMMINENT DANGER**

- A. The Contractor shall be wholly responsible for any accidents (including death) occurring at any time during the progress of the Work and until the final acceptance of the Work by the City which may happen to any of workers or those of any Subcontractor employed on the building project, or for any damage or injuries (including death) which their work and operations may cause to the Work being constructed, or to existing buildings, or to any tenants and occupants of the property, or of the adjoining properties, or to the public, or to any public or private property.

#### **1.07 SAFETY**

- A. The Contractor shall ensure that all employees, visitors, subcontractor's employees, and suppliers' employees, while on the work site, comply with the requirements of WISHA, these requirements, and the safety precautions contained in the several other Specifications Sections. The Contractor shall promptly and fully comply with, execute and, without separate charge thereof to the City, shall enforce compliance with the provisions of the Washington Industrial Safety and Health Act of 1973, with particular attention paid but not limited to Chapter 296-155, WAC Safety Standards for Construction Work; with particular attention paid but not limited to Chapter 296-24 WAC General Safety and Health Standards; with particular attention paid but not limited to Chapters 296-27, 196-350 and 296-360 WAC regarding Administrative Safety and Health Act Chapter 49-17 RCW, and any addenda thereto.

- B. The Contractor shall immediately advise the City of inspections conducted by WISHA at the work site and shall transmit copies of citations and violations to the City and Design Professional.

#### **1.08 SAFETY RESPONSIBILITIES**

- A. Contractor shall be responsible to:
  - 1. Ensure compliance with these requirements, WISHA requirements, and other safety requirements.
  - 2. Authorize immediate action to correct substandard safety conditions.
  - 3. Review and act to ensure compliance with safety procedures with their supervisors, subcontractors, and suppliers.
  - 4. Make thorough daily safety inspections of the work site and immediately act to eliminate unsafe acts and unsafe conditions.
  - 5. Investigate worksite accidents and recommend immediate corrective action.
  - 6. Assist in the preparation of accident investigation and reporting procedures.
  - 7. Be responsible for the control, availability, and use of safety equipment, including employee personal protective equipment.
  - 8. Design and submit a Health and Safety Plan.
- B. Contractor shall generate and submit a Health and Safety Plan (HASP) for the Project, including all aspects of project demolition, abatement, soil remediation and new construction. The HASP shall specifically address potential hazards associated with earthwork and management of groundwater. Any soil and groundwater encountered during performance of work proximate to the Boiler Building should be assumed to be impacted and handled accordingly. Soil and groundwater analytical samples have been collected from around the Boiler Building and the analytical data is provided in the RI/FS/CAP Report provided in Appendix B.
- C. Design Professional and Owner's Representative will not comment on or approve the health and safety plan. Submission is for their reference only. All health and safety procedures are solely the Contractor's responsibility.

#### **1.09 REQUESTS FOR VARIANCES**

- A. Requests for variances to deviate from WISHA requirements must follow the current established procedures by that Agency.

#### **1.10 FAILURE TO COMPLY**

- A. If the project is shut down due to the Contractor's failure to comply with the requirements of Washington Industrial Safety and Health Act (WISHA) or other applicable safety requirements, no part

of the time loss due to any such suspension of operations or stop orders shall be made the subject of a claim for extension of time or for increased cost or damage by the Contractor.

#### **1.11 Submittals**

- A. Provide Contractor HASP prior to construction
- B. Include example Job Hazard Analysis forms.

### **PART 2 PRODUCTS**

(NOT USED)

### **PART 3 EXECUTION**

#### **2.01 CONTRACTOR HEALTH AND SAFETY PLAN**

- A. Contractor HASP must be prepared and submitted to the Engineer, prior to commencing work. The Design Professional will confirm that the HASP has been prepared, addressing the requirements stated below. However, the Design Professional will not review or approve the content of the Contractor HASP.
- B. It is the sole responsibility of Contractor to develop a HASP addressing site hazards, and meeting applicable local, state, and federal regulations. Additionally, it is the sole responsibility of Contractor to ensure that workers understand and abide by the provisions of the HASP. Contractor HASP must address the following requirements:
  - 1. Description of Work—Contractor HASP shall provide an overview of the site, define work to be performed by the Contractor and identify potential hazards and Job Hazard Analysis procedures.
  - 2. Chain of Command—The HASP shall include a chain of command for on-site workers, in the event of an emergency situation. The chain of command outlined in the HASP shall provide assignment of health and safety responsibilities at the jobsite.
  - 3. Potential Chemical Hazards—HASP shall provide site workers with information regarding the chemical hazards associated with contaminated materials, including potential routes of exposure, and symptoms of exposure.
  - 4. Contaminant Control Measures—HASP shall outline the PPE required for on-site workers, including protective measures for specific activities and protective measures for handling both soil and groundwater.
  - 5. The Contractor shall maintain site control measures in areas of the site where exposure to contaminated material is possible. The Contractor should limit access to areas of the site where contamination is present, and establish decontamination procedures for workers and equipment

exposed to contaminated material to prevent contaminant transport beyond the Work Areas. All equipment in contact with project site soil shall be decontaminated (i.e., steam cleaned) before leaving the Work Area.

6. Worker Safety and Training—All individuals expected to work within areas with potential to contact contaminated material will be responsible for reading and understanding the HASP, prior to commencing Work. The HASP shall be amended as needed to include special work practices warranted by site-specific conditions. The amendments shall be included as addendum documents to the HASP. The HASP shall define OSHA training requirements, as specified in WAC 296-62-3040 that may be applicable to the Work. Training and amendment requirements shall be specified in the HASP.
7. Medical Surveillance—A medical surveillance program, if the Contractor determines that one is required, should be instituted by the Contractor or subcontractor for employees having the greatest potential for exposure to contaminated material. The content of the exam and the identification of personnel required to have medical surveillance will be determined by the Contractor or subcontractor. Medical surveillance requirements will be specified in the HASP.
8. Emergency Response and Notification—The HASP shall include an emergency response plan to address vital emergency response procedures for field personnel. Contractors shall notify the Owner and Engineer within 24 hours of any emergency event, or HASP violation. If an individual is injured, the Contractor shall file a detailed accident report for submittal to the Owner and Engineer within 24 hours of the accident. Accident reporting requirements shall be specified in the HASP.

**END OF SECTION**

## **00 73 43 INSTRUCTIONS FOR PREVAILING WAGE REQUIREMENTS**

Dear Contractor:

To ensure the City of Mercer Island is in compliance with Revised Code of Washington (RCW) section 39.12.040 on prevailing wages, some changes are being made to our process.

Contractors submitting invoices for payment on City projects must provide the following information before their payment requests will be processed

- Statements of Intent to Pay Prevailing Wages meeting the requirements of the Revised Code of Washington (RCW) section 39.12.040 must be submitted to Sarah Bluvas, Capital Project Manager at [sarah.blucas@mercerisland.gov](mailto:sarah.blucas@mercerisland.gov) for each contractor and subcontractor.
- Each invoice submitted for payment must state that prevailing wages have been paid in accordance with the pre-filed statements of prevailing wages submitted to Sarah Bluvas, Capital Project Manager at [sarah.blucas@mercerisland.gov](mailto:sarah.blucas@mercerisland.gov).
- A list of subcontractors must accompany each invoice submitted for payment. New subcontractors must be separately identified on the list of subcontractors and must have submitted their Intent to Pay Prevailing Wages document to Sarah Bluvas, Capital Project Manager at [sarah.blucas@mercerisland.gov](mailto:sarah.blucas@mercerisland.gov).

Please make sure the person submitting your invoices for payment is aware of the new requirements so we may pay you as quickly as possible.

### **Definitions and Resources:**

#### **Prevailing Wage**

Prevailing Wage is defined as the hourly wage, usual benefits, and overtime, paid in the largest city in each county, to the majority of workers, laborers, and mechanics. Prevailing wages are established by the Department of Labor & Industries for each trade and occupation employed in the performance of public work. They are established separately for each county, and are reflective of local wage conditions.

#### **Journey Level Rates**

Look up, print, and download Journey Level Rates for multiple trades in multiple counties at

<https://secure.lni.wa.gov/wagelookup/>

#### **Apprentice Rates**

Look up, print, and/or download apprentice rates by trade, county, and program at

<https://secure.lni.wa.gov/wagelookup/ApprenticeWageLookup.aspx>

For further questions, concerns, or a copy of the RCW referenced, please contact the Owner at the phone number and email address provided.

**END OF SECTION**



**DIVISION 01      GENERAL CONDITIONS**

**01 00 01   COVER PAGE**

## **01 11 00 SUMMARY OF WORK**

### **PART 1 GENERAL**

#### **1.01 SCOPE OF WORK**

- A. The Work to be done under this Contract is to describe a complete Project to be constructed in accordance with the Contract Documents. Contractor shall furnish all labor, equipment, materials, tools, transportation, permits, incidentals, and supplies, and perform the Work required in accordance with the Contract Documents.
- B. This Contract includes Work as described below. The description is summarized and may not include specific reference to all incidental Work elements required to complete the Contract. Include all labor, materials, equipment and incidentals required for completion of the Work as shown on the Drawings and Technical Specifications herein.
- C. Division **02 - 35** technical specifications provided herein define the Work which includes the following:
  - 1. Abbreviated Written Summary
    - a. Briefly and without force and effect on requirements of the Contract Documents, the description of the Work of the Contract can be summarized as follows: To furnish all labor, materials and equipment for supervision and other facilities necessary to construct Project as described.
  - 2. The work shall include those work items generally related to all work required to complete the project, but not limited to, the following:
    - a. Demolition of existing overwater concrete pier structures and extraction of creosote-treated timber piles; waterfront plaza soil remediation; and construction of plaza improvements including walls, landscaping, plantings, ADA-accessible routes, and upgraded pavement surfaces. In-water work includes driving small- and large-diameter steel piles; engineered design, manufacturing, and installation of floating concrete wave attenuator mooring floats and low-freeboard special purpose floats including an aluminum framed ADA kayak launch; repair of an existing floating timber-framed dock; nearshore lake bed cleanup; repair of an existing concrete pier including timber pile cap replacements and fiberglass jacketing with epoxy grout injection of existing creosote-treated timber piles. Additional site work includes construction of fire protection standpipes with associated trenching; trenching for electrical service improvements; and improved beach access.

#### **1.02 CONSTRUCTION SPECIFIC CONTRACTS**

- A. The Contractor shall provide all items, articles, materials, operations or methods listed, noted or scheduled on the Drawings and/or Project Manual, including all labor, equipment and incidentals necessary and required for proper and timely completion of the Work. The Contractor shall use new materials unless specifically noted or directed.
- B. Work not specifically covered in the Project Manual and/or Drawings shall be performed in accordance with the current Local, County, State, or National reference standards.

### **1.03 USE, COORDINATION, AND INTERPRETATION OF DOCUMENTS**

- A. Technical Specifications are enumerated in the Table of Contents of the Project Manual. The numbering of Sections is for identification only and may not be consecutive. The Contractor shall check their copies of the Technical Specifications with the Table of Contents to verify that they are complete. The Contractor shall notify the Owner's Representative of incomplete copies.
- B. It is mutually agreed and understood between the City and the Contractor that if any instance of contradiction between drawings of different scale, or between drawings and specifications, or between sections of the specifications, the more stringent requirements shall be interpreted as being in the Contract Sum.
- C. The Contract, Drawings, Specifications, Contract Change Orders, and all supplementary documents are essential parts of the Contract, and a requirement occurring in one is as binding as though occurring in all. They are intended to be coordinated and to describe and provide for a complete Work.
  - 1. Should it appear that the Work or any of the matters relative thereto are not sufficiently detailed or explained in the Contract Documents, the Contractor shall seek clarification in writing from the Owner's Representative for further explanations necessary and shall conform to them as part of the Contract. In the event of any doubt or questions arising regarding the true meaning of the Contract, reference shall be made to the Owner's Representative whose decision thereon shall be final.
  - 2. Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by the City. If, during the performance of the Work, Contractor finds a conflict, error, inconsistency, or omission in the Contract Documents, the Contractor must promptly and before proceeding with the Work affected thereby, report such conflict, error, inconsistency, or omission to the Owner's Representative in writing.
- D. The Contract Documents are complementary. What is required by one part of the Contract Documents is binding as if required by all. For example, anything mentioned in the Project Manual and not shown on the Drawings, or shown on the Drawings and not mentioned in the Project Manual, is of like effect as if shown or mentioned in both. In the case of any conflict, the more stringent conditions shall apply.

- E. Contractor may do no Work without applicable Drawings, Specifications, written modifications, or Shop Drawings where required, unless instructed to do so by the City. 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, Contractor will be responsible for the performance and bear the cost of correction.
- F. 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.

#### **1.04 ORDERING LONG-LEAD EQUIPMENT/MATERIAL ITEMS**

- A. The Contractor shall schedule and prioritize the ordering and delivery of material as required, ensuring that the Work can be completed within the Contract Time.

#### **1.05 PROJECT SCHEDULE**

- A. Refer to [00 72 13 GENERAL CONDITIONS](#).
- B. Pre-construction scheduling and submittals may commence upon start of contract period, after approval by City Council.

#### **1.06 WORK UNDER OTHER CONTRACTS**

- A. The City reserves the right to contract for other work or to conduct work with its own forces should the need arise.
- B. Cooperate fully with separate contractors or the City's forces so that work under separate contracts or City's work may be carried out efficiently, without interfering with or delaying Work under this Contract or the Work of this contract interfering or delaying the Work under the other separate contracts or the work of the City's forces.

#### **1.07 CONTRACTOR USE OF PREMISES**

- A. Use of the Site: Limit use of the premises to work in areas indicated. Confine operations to areas within Project limits indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated. Use of site does not cover use of adjacent right of ways, public or private property except as noted below. Consult local jurisdictions or landowners where use of property under their control is considered necessary and conform to their requirements for use thereof.
  - 1. Nothing in the Contract grants to the Contractor exclusive occupancy of the site of the Project. The Contractor must ascertain to its own satisfaction the scope of the Project and the nature of any other contracts that have been or may be awarded by the City in the construction of the Project, to the end that the Contractor may perform this Contract in the light of such other contracts, if any.

2. The Contractor may not cause any unnecessary hindrance or delay to any others working on the Project. If the performance of any contract for the Project is likely to be interfered with by the simultaneous performance of some other contract or contracts, the City, based upon recommendations of the Owner's Representative, will decide which Contractor must cease work temporarily and which Contractor may continue or whether the work under the contracts can be coordinated so that the Contractors may proceed simultaneously. On all questions concerning conflicting interest of contractors performing related work, the decision of the City is binding upon all contractors concerned and the City is not responsible for any damages suffered or extra costs incurred by the Contractor resulting directly or indirectly from the award or performance or attempted performance of any other contract or contracts on the project or caused by a decision or omission of the City respecting the order of precedence in the performance of the contracts.
- B. Site Closure: The Project site will be closed to the public for the duration of this Project's construction. Contractor is required to install signage at the fenced perimeter as indicated on the Construction Plans to inform the public of the site's closure. The contractor is responsible for damage to the property, materials and the site while the Project site is under the control of the Contractor. Contractor shall maintain signage until Final Acceptance. The park area beyond the project site will remain open to the public for the duration of construction.
- C. The Contractor will be allowed to establish a staging area within the Project limits.
- D. Enclosure Fence: Install a 6 ft. ht. enclosure fence with lockable entrance gates to enclose the project site including equipment and materials as required. Contractor is required to protect all existing properties, equipment, structures, and finishes on the site from damage. Contractor will provide Owner's Representative with access to unlock the entrance gates (padlock code, daisy chain lock, etc.) for emergency access to the project site.
- E. Access: The Contractor and subcontractors will be allowed on site only during their working periods. The Contractor shall use the designated location for site access.
- F. Storage of Materials: The Contractor shall use the designated location for storage of materials. The City shall not be held accountable for missing, damaged or vandalized materials.

#### **1.08 DISPOSAL OF DEBRIS**

- A. Refer to [00 72 13 GENERAL CONDITIONS](#).
- B. Refer to [00 73 18 HEALTH AND SAFETY REQUIREMENTS](#).

#### **1.09 MATERIAL AND EQUIPMENT STOCKPILE LOCATIONS AND CITY STORED EQUIPMENT**

- A. Stockpile materials and equipment only on approved areas of the site. Stockpile areas may not endanger or inhibit the public users of the site, outside the work area, in any way.

- B. Unless otherwise provided, materials removed and not re-used under the Contract shall all become the property of the Contractor. Salvage value of such material shall be taken into consideration in the preparation of the Bids, but no separate credit therefore may be stated. Materials shall be removed from the site by the Contractor and storage or sale of the materials on the site is not permitted.

#### **1.10 PROPERTY RIGHTS IN MATERIALS**

- A. Nothing in the Project Documents vests in the Contractor any property right in the materials used after they have been attached or affixed to the Work or the soil, or after payment has been made by the City for materials delivered to the site of the Work, or stored subject to or under the control of the City.
- B. All such materials become the property of the City upon being so attached or affixed or upon payment for materials delivered to the site of the Work or stored subject to or under the control of the City. Soil, stone, gravel, and other materials found at the site of the Work and which conform to the specifications for incorporation into the Work may be used in the Work, following written authorization by the Owner's Representative. No other use may be made of such materials except as may be otherwise described in the plans and specifications.

#### **1.11 SALVAGED MATERIALS**

- A. Salvage only items that are noted in the Contract Documents. The City retains first right of refusal to salvage all materials, equipment, and or products identified or not identified in the Contract Documents that are affected as part of the Work.

#### **1.12 OCCUPANCY REQUIREMENTS**

- A. Partial City Occupancy: The City reserves the right to occupy and to place and install equipment in completed areas of the project prior to Substantial Completion. Such placing of equipment and partial occupancy shall not constitute Substantial Completion, acceptance of the Work occupied, or the total Work.
  - 1. Prior to partial City occupancy, all components and systems of the Contract shall be in place and working completely and safely so as to provide the City with a complete and functional environment. Required inspections and tests shall have been successfully completed.
  - 2. Upon occupancy, the City will assume responsibility for custodial service for occupied portions of the facility if all work has been completed and Contractor has performed final cleaning in spaces to be occupied. City occupancy does not relieve the Contractor of any contractual obligation including punchlist follow-up, warranty work, and final cleaning requirements.

## **PART 2 PRODUCTS**

(NOT USED)

**PART 3 EXECUTION**

(NOT USED)

**END OF SECTION**

## **01 21 00 ALLOWANCES**

### **PART 1 GENERAL**

#### **1.01 RELATED DOCUMENTS**

- A. [00 41 13 BID FORM](#) for acknowledgement of allowances in the Bid.
- B. [01 22 00 UNIT PRICES](#) for procedures using unit prices.
- C. [01 26 00 CONTRACT MODIFICATION PROCEDURES](#) for procedures related to Change Orders.
- D. Divisions 02 through 35 for items of Work covered by allowances.

#### **1.02 SUMMARY**

- A. Section includes administrative and procedural requirements governing allowances.
  - 1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements to defer selection of actual materials and equipment to a later date when direction will be provided to the Contractor. If necessary, additional requirements will be issued by Change Order as outlined in [01 26 00 CONTRACT MODIFICATION PROCEDURES – Section 1.08](#).
- B. Types of allowances include the following:
  - 1. Lump-sum allowances
  - 2. Quantity allowances

#### **1.03 SELECTION AND PURCHASE**

- A. At the earliest practical date after award of the Contract, advise the Owner's Representative and Design Professional of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At the Design Professional's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by the Design Professional from the designated supplier.

#### **1.04 SUBMITTALS**

- A. Submit proposals for purchase of products or systems included in allowances using [00 63 63 CHANGE ORDER FORM](#).
- B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.



- C. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- D. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

#### **1.05 COORDINATION**

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

#### **1.06 LUMP-SUM AND QUANTITY ALLOWANCES**

- A. Allowances shall include direct material costs to the Contractor of specific products and materials ordered by the Owner's Representative or selected by the Design Professional under the allowance and shall include taxes, freight, and delivery to the Project Site.
- B. The Contractor's direct labor costs, construction equipment usage costs, subcontractor costs, and fee for receiving and handling at the Project Site, which includes labor, installation, freight, overhead and profit, and similar costs related to products and materials selected by the Design Professional under the allowance, shall be included as part of the allowance.
  - 1. Allowance does not include Washington State Sales Tax (WSST).
- C. Unused Materials: Return unused materials purchased under an allowance to the manufacturer or supplier for credit to the Owner after installation has been completed and accepted.
  - 1. If requested by the Design Professional, retain and prepare unused material for storage by the Owner's Representative. Deliver unused material to the Owner's storage facility as directed.
- D. Quantity Allowances Determination: Calculate and provide the Quantity Allowance amount by multiplying the given quantity and the unit price identified in Part 3 – Schedule of Allowances of this section. The calculated Quantity Allowance amount must be listed on the Bid Form.

#### **1.07 ADJUSTMENT OF ALLOWANCES**

- A. To adjust allowance amounts, prepare a Change Order proposal based on the difference between the purchase amount and the allowance. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
  - 1. Include installation costs in purchase amount only where indicated as part of the allowance.
  - 2. If requested, prepare an explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
  - 3. Submit substantiation of a change in Scope of Work, if any, claimed in Change Orders related to unit-cost allowances.

4. The Owner's Representative reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount of Contractor's handling, labor, installation, overhead, and profit. Submit claims within 14 days of receipt of Change Order or Construction Change Directive authorizing work to proceed. The Owner's Representative will reject claims submitted later than 21 days after such authorization.
  1. Do not include the Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of the Work has changed from what could have been foreseen from information in the Contract Documents.
  2. No change to the Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems on the same scope and nature as originally indicated.

## **PART 2 PRODUCTS**

(NOT USED)

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to the manufacturer for replacement.

### **3.02 PREPARATION**

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related Work.

### **3.03 SCHEDULE OF ALLOWANCES**

- A. Allowance No. 1: Lump Sum Allowance – Include the sum of \$100,000 for Unforeseen Conditions. The allowance is applicable to unforeseen civil, structural, mechanical, plumbing, architectural, or irrigation conditions that could not have been anticipated and result in an approved change in the Work and change in cost. The allowance shall also be applicable to changes in the Work requested by the Owner's Representative.
- B. Allowance No. 2: Lump Sum Allowance – Include the sum of \$3,000 for Apprenticeship Utilization. This allowance is applicable for meeting requirements of RCW 39.04.320.
- C. Allowance No. 3: Lump Sum Allowance – Include the sum of \$90,000 Repairs to Existing Floating Wood Dock. The allowance is applicable to evaluating and implementing needed repairs for the existing floating wood dock that will be repurposed for the project.

D. Additional incidental allowances referenced in other sections shall be included in the base bid.

**END OF SECTION**

## **01 22 00 UNIT PRICES**

### **PART 1 GENERAL**

#### **1.01 RELATED DOCUMENTS**

- A. [00 21 13 INSTRUCTIONS TO BIDDERS](#) for instructions for preparation of pricing for Unit Prices.
- B. [00 41 13 BID FORM](#)
- C. [01 26 00 CONTRACT MODIFICATION PROCEDURES](#) for additional modification procedures.
- D. [01 29 00 PAYMENT PROCEDURES](#) for additional payment procedures.

#### **1.02 SUMMARY**

- A. List of Unit Prices, for use in preparing Bids.
- B. Measurement and payment criteria applicable to Work performed under a unit price payment method.

#### **1.03 COSTS INCLUDED**

- A. Unit Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

#### **1.04 UNIT QUANTITIES SPECIFIED**

- A. Quantities indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements of actual Work will determine the payment amount.

#### **1.05 MEASUREMENT OF QUANTITIES**

- A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.
- B. Take all measurements and compute quantities. Measurements and quantities will be verified by Owner.
- C. Assist by providing necessary equipment, workers, and survey personnel as required.
- D. Measurement Devices:
  - 1. Weigh Scales: Inspected, tested and certified by the applicable state Weights and Measures department within the past year.
  - 2. Platform Scales: Of sufficient size and capacity to accommodate the conveying vehicle.
  - 3. Metering Devices: Inspected, tested and certified by the applicable state department within the past year.

- E. Measurement by Weight: Concrete reinforcing steel, rolled or formed steel or other metal shapes will be measured by handbook weights. Welded assemblies will be measured by handbook or scale weight.
- F. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.
- G. Measurement by Area: Measured by square dimension using mean length and width or radius.
- H. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord.
- I. Stipulated Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as a completed item or unit of the Work.
- J. Contractor's Engineer Responsibilities: Sign surveyor's field notes or keep duplicate field notes, calculate and certify quantities for payment purposes.

#### **1.06 PAYMENT**

- A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Design Professional, multiplied by the unit price.
- B. Payment will not be made for any of the following:
  - 1. Products wasted or disposed of in a manner that is not acceptable
  - 2. Products determined as unacceptable before or after placement
  - 3. Products not completely unloaded from the transporting vehicle
  - 4. Products placed beyond the lines and levels of the required Work
  - 5. Products remaining on hand after completion of the Work
  - 6. Loading, hauling, and disposing of rejected Products

#### **1.07 DEFECT ASSESSMENT**

- A. Replace Work, or portions of the Work, not complying with specified requirements.
- B. If, in the opinion of Design Professional, it is not practical to remove and replace the Work, Design Professional will direct one of the following remedies:
  - 1. The defective Work may remain, but the unit price will be adjusted to a new unit price at the discretion of Design Professional.
  - 2. The defective Work will be partially repaired to the instructions of the Design Professional, and the unit price will be adjusted to a new unit price at the discretion of Design Professional.

- C. If, in the opinion of Owner, it is not practical to remove and replace the Work, Owner will direct one of the following remedies:
  - 1. The defective Work will be partially repaired to the instructions of the Owner, and the unit price will be adjusted to a new unit price at the discretion of Owner.
- D. The individual specification sections may modify these options or may identify a specific formula or percentage price reduction.
- E. The authority of Owner to assess the defect and identify payment adjustment is final.

## **1.08 SCHEDULE OF UNIT PRICES**

### **BID ITEM 1: MOBILIZATION – LUMP SUM**

The lump sum contract price for this bid item shall be full compensation for all costs associated with mobilization of construction equipment and costs of preparatory work and operations performed by the Contractor that are not defined as a part of a payment item. This includes, but is not limited to, those costs necessary for the movement of its personnel, equipment, supplies and incidentals to and from the project site; temporary facilities and controls; any and all additional temporary construction fencing beyond that shown on the TESC drawings; for other work and operations which it must perform or costs it must incur before beginning production work on the various items on the project site; and for removal of personnel, equipment, supplies, offices, building facilities, sheds, fencing, and other incidentals from the site. The bid item also includes all costs and fees to prepare, obtain, and maintain all required construction permits. The bid item also includes all work associated with all required miscellaneous construction submittals that are not included with other bid items.

Payment for Mobilization will be made at the lump sum price in the Bid Schedule in the Bid Form. This price and payment will be made in accordance with the current WSDOT Standard Specifications Section 1-09.7.

### **BID ITEM 2: SHORING AND TRENCH SAFETY SYSTEMS – LUMP SUM**

This bid item will be measured on a lump sum basis.

The lump sum contract price for this bid item shall be full compensation for all costs associated with furnishing and utilizing adequate safety systems for trench excavations exceeding a depth of four feet. Shoring related to removal of the Underground Storage Tanks (USTs) will be paid under the applicable unit price bid items in the Schedule of Unit Prices.

Contractor shall provide adequate safety systems for excavations that meet the requirements of the Washington Industrial Safety and Health Act (WISHA) and OSHA. Excavations shall be in accordance with the specified construction requirements and requirements outlined in the current WSDOT Standard Specifications section 2-09.

### **BID ITEM 3: SURVEY – LUMP SUM**

This bid item will be measured on a lump sum basis.

The lump sum contract price for this bid item shall be full compensation to complete the Work as shown and specified herein including: furnishing, setting, and maintain monitoring points; re-establish monitoring points, if damaged; surveying monitoring points; and recording and reporting results to the Design Professional. Reference Specifications Section 02 41 13 – Site Demolition for additional detail requirements for settlement monitoring.

This bid item shall be full compensation for materials, labor, equipment, and incidentals to conduct pre-construction surveys and construction.

**BID ITEM 4: TEMPORARY EROSION AND SEDIMENT CONTROL – LUMP SUM**

The lump sum contract price for this bid item shall be full compensation all costs associated with all materials, tools, equipment, labor, and incidentals required to perform all temporary erosion and sediment control and water quality management activist as shown in the Drawings and specified in the Contract Documents. This pay item includes, but is not limited to, installation, modification, maintenance, and removal of: inlet protection, temporary sediment barriers, filter fabric fences, tree protection fencing, stabilized construction entrances, stormwater reroute systems, and floating debris booms for the duration of the contract. The Work also includes complying with all applicable permit requirements related to temporary erosion and sediment control, including but not limited to water monitoring and contingency measure to be implemented if water quality violations occur.

Payment for Temporary Erosion and Sediment Control will be made at the lump sum price in the Bid Schedule in the Bid Form. This price and payment will be made on the following basis:

- A. 50% after implementation of temporary erosion and sedimentation measure and the TESC plan have both been approved by the Design Professional.
- B. 100% after completion of all work on the project, including cleanup and acceptance of the project by the City.

**BID ITEM 5: TEMPORARY WATER TREATMENT AND DISPOSAL – LUMP SUM**

The lump sum contract price for this bid item shall be full compensation for all costs associated with all materials, tools, equipment, labor, and incidentals required to perform all handling and treatment of TESC water and dewatering water as shown in the Drawings and as specified in the Contract Documents. This pay item includes, but is not limited to, installation, modification, maintenance, and removal of: sumps, pumps, hoses, connection, tanks, and appurtenances to provide treatment of TESC and dewatering water for the duration of the contract. The Work include sampling and reporting as required by necessary permits for discharge of construction and dewatering water.

Payment for Temporary Water Treatment and Disposal will be made at the lump sum price in the Bid Schedule in the Bid Form.

Temporary Water Treatment and Disposal shall not include dewatering equipment, hoses, labor, temporary power, and other items for removing water for the purpose of dewatering excavations. Those items will be paid under the applicable unit prices bid items in the Schedule of Unit Prices

**BID ITEM 6: CONSTRUCTION DEWATERING – LUMP SUM**

The lump sum contract price for this bid item shall be full compensation for all costs associated with materials, tools, equipment, labor, and incidentals required to establish dry excavation zone and subgrade conditions, provide flow reporting, pumping, temporary transmission lines, temporary power, and appurtenances to dewater the excavation zones.

Payment for Construction Dewatering will be made at the lump sum price in the Bid Schedule in the Bid Form.

**BID ITEM 7: DEMOLITION (BOILER BUILDING PLAZA) – LUMP SUM**

The lump sum contract price for this bid item shall be full compensation for furnishing all labor, materials, tools, equipment, haul, disposal, and incidentals required to satisfactorily complete the Work and shall include all demolition and disposal described herein and shown on the Drawings unless noted otherwise. Items to be demolished include utilities, pavement, monitoring wells, structures, and other miscellaneous items as shown in the Drawings, unless included with another bid item. This bid item also includes clearing and grubbing, removal of trees, and disposing of material to complete the work as shown in the Drawings. Work includes salvage and delivery to the City of items as described in Section 02 41 13 – Site Demolition.

Demolition includes full depth pavement removal except for pavement planing. Those items will be paid under the applicable unit price bid items in the Schedule of Unit Prices as described in Section 32 12 16 – Asphalt Paving. Other work included under different bid items include, but are not limited to:

- A. Demolition Utility Trenching.
- B. Demolition Cleanup Action Excavation.
- C. Pier and Dock Demolition.

**BID ITEM 8: DEMOLITION (UTILITY TRENCHING) – LUMP SUM**

The lump sum contract price for this bid item shall be full compensation for furnishing all labor, materials, tools, equipment, haul, disposal, and incidentals required to satisfactorily complete the work for utility trenching and shall include all demolition and disposal necessary to install utility trenches for fire water lines and the Boiler Building electrical service outside of the plaza improvement area described herein and as shown on the Drawings unless noted otherwise. Items to be demolished include utilities, pavement, structures, and other miscellaneous items, unless included with another bid item. This bid item also includes clearing and grubbing, removal of trees, and disposing of material to complete the work as shown in the Drawings.

Demolition includes full depth pavement removal except for pavement planing. Those items will be paid under the applicable unit price bid items in the Schedule of Unit Prices as described in Section 32 12 16 – Asphalt Paving.

**BID ITEM 9: DEMOLITION (CLEANUP ACTION EXCAVATION) – LUMP SUM**

The lump sum contract price for this bid item shall be full compensation for furnishing all labor, materials, tools, equipment, haul, disposal, and incidentals required to complete demolition of utilities and portions of



the USTs within the limits of the cleanup action excavation limits as shown in the Drawings. Items to be demolished include utilities, portions of the USTs, pavement, structures, and other miscellaneous items, unless included with another bid item. This bid item also includes obtaining permits, notifying fire and regulatory agencies, cleaning, interning, cutting, removing, disposal, and reporting for the demolition of the USTs

**BID ITEM 10: EARTHWORK (CLEANUP ACTION EXCAVATION) – TONS**

This bid item will be measured by the ton of excavation soil from the cleanup action area as shown in the Drawings, or as altered by the Design Professional.

The unit price shall be full compensation for furnishing all materials, labor, tools, equipment and all other costs and expenses necessary or incidental to the preparation, excavation, backfill, trench, on-site haul, import, scarify, stockpile, load, place, grade, and compact up to the subgrade and other associated work required to conduct the cleanup action excavation as shown in the Drawings. This work includes providing structural shoring to remove USTs, or portions of the USTs.

The pay quantity shall be measured as tons of soil removed from the cleanup action excavation area disposed of at a licensed facility as measured by certified scale and scale tickets provided to the Owner.

**BID ITEM 11: EARTHWORK (PLAZA IMPROVEMENTS) – LUMP SUM**

This bid item will be measured on a lump sum basis. The lump sum shall be full compensation for furnishing all materials, labor, tools, equipment and all other costs and expenses necessary or incidental to the preparation, excavation, backfill, trench, on-site haul, import, scarify, stockpile, load, place, grade, and compact up to the subgrade and other associated work required to conduct excavation or placement of imported material as shown in the Drawings for subgrade preparations for the plaza improvements. Plaza improvements include:

- A. South Beach trail and on-grade ramp, up to and including connections to the existing waterfront trail, access drive, and playground trail.
- B. Plaza improvements around the existing Boiler Building.
- C. North Beach and ADA Ramp up to and including connection to the waterfront trail.

Items that will be paid under applicable unit price bid items in the Schedule of Unit Prices Work include, but are not limited to:

- A. Earthwork for storm drainage infrastructure, including permeable paver underdrain, silva cell, stormwater pipe, and storm drainage structures.
- B. Earthwork for the Cleanup Action Excavation.
- C. Earthwork for utilities including sanitary sewer, electrical service, and fire water.

The estimated quantity of excavation and placed backfill for this pay item is:

- A. 300 bank cubic yards of excavation

B. 60 bank cubic yards of backfill

BID ITEM 12: SOIL DISPOSAL (IMPACTED) – TONS

This bid item will be measured by the ton for disposing of contaminated soil to a licensed disposal facility. The unit price shall be full compensation for furnishing all materials, labor, tools, tipping fees, equipment and all other costs and expenses necessary or incidental to the haul, dewater, reload, and dispose of contaminated soil.

The pay quantity shall be measured as tons of contaminated soil disposed of at a licensed disposal facility as measured by certified scale and scale tickets provided to the Owner.

BID ITEM 13: SOIL DISPOSAL (CLEAN) – TONS

This bid item will be measured by the ton for off-site disposal of clean soil to a licensed soil receiving facility. The unit price shall be full compensation for furnishing all materials, labor, tools, tipping fees, equipment and all other costs and expenses necessary or incidental to the haul, dewater, reload, and dispose of excess clean soil.

The pay quantity shall be measured as tons of material as measured by certified scale and scale tickets provided to the Owner.

BID ITEM 14: PETROFIX – POUNDS

This bid item will be measured by the pound. The unit price shall be full compensation for furnishing all materials, labor, tools, equipment and all other costs and expenses necessary or incidental to the furnishing, delivery, handling, storing, mixing, application, cleanup, disposal of excess material and other associated work to apply the material to the cleanup excavation sidewalls and bottom as shown in the Drawings.

BID ITEM 15: CRUSHED SURFACING (PLAZA IMPROVEMENTS) – CUBIC YARDS

This bid item will be measured by the cubic yards of placed crushed surfacing top course and crushed surfacing base course for concrete and asphalt pavement as shown in the Drawings for plaza improvements. The unit price shall be full compensation for furnishing all materials, labor, tools, equipment and all other costs and expenses necessary or incidental to the preparation of the subgrade, furnishing, screening, loading, hauling, stockpiling, mixing, placing, shaping and compacting of the materials, water included and for other work required to provide a completed base for pavement.

Crushed Surfacing – Plaza improvements is for placement of crushed surfacing top course and crushed surfacing base course for pavement proximate to the existing boiler building, not directly related to utility trench restoration. Placement of base and top course for utility trench pavement restoration will be paid under the applicable unit price bid items in the Schedule of Unit Prices.

The pay quantity shall be calculated from the neat line dimensions as shown in the Drawings or as altered by the Design Professional.

BID ITEM 16: ASPHALT PAVEMENT (PLAZA IMPROVEMENTS) – TONS

This bid item will be measured by the ton of placed asphalt pavement in areas as shown in the Drawings for plaza improvements. The unit price shall be full compensation for furnishing all materials, labor, tools, equipment and all other costs and expenses necessary or incidental to the preparation, screening, loading, hauling, mixing, placing, shaping and compacting of the materials, water included and for other work required to provide a complete paved surface. Costs for Tack Coat, Joint Sealer, Crack Repair, Adjusting Existing Utility Structures to Grade and other appurtenances necessary to complete the work will be considered incidental to these items and no additional compensation shall be made for those items of work.

Asphalt Pavement – Plaza Improvements is for placement of asphalt proximate to the existing boiler building, not directly related to utility trench restoration. Asphalt pavement for utility trench restoration will be paid under the applicable unit price bid item in the Schedule of Unit Prices.

The pay quantity shall be measured as tons of delivered material as measured by certified scale and scale tickets provided to the Owner for all material delivered and placed in accordance with the Drawings.

**BID ITEM 17: CRUSHED SURFACING (UTILITY TRENCHES) – CUBIC YARDS**

This bid item will be measured by the cubic yards of placed crushed surfacing top course and crushed surfacing base course for concrete and asphalt pavement as shown in the Drawings for utility trenching restoration. The unit price shall be full compensation for furnishing all materials, labor, tools, equipment and all other costs and expenses necessary or incidental to the preparation of the subgrade, furnishing, screening, loading, hauling, stockpiling, mixing, placing, shaping and compacting of the materials, water included and for other work required to provide a completed base for pavement.

Crushed Surfacing – Utility Trenches is for placement of crushed surfacing top course and crushed surfacing base course for pavement as part of utility trench restoration. Placement of base and top course as part of plaza improvements will be paid under the applicable unit price bid items in the Schedule of Unit Prices.

The pay quantity shall be calculated from the neat line dimensions as shown in the Drawings or as altered by the Design Professional.

**BID ITEM 18: ASPHALT PAVEMENT (UTILITY TRENCHES) – TONS**

This bid item will be measured by the ton of placed asphalt pavement in areas as shown in the Drawings for utility trenching restoration. The unit price shall be full compensation for furnishing all materials, labor, tools, equipment and all other costs and expenses necessary or incidental to the preparation, screening, loading, hauling, mixing, placing, shaping and compacting of the materials, water included and for other work required to provide a complete paved surface. Costs for Tack Coat, Joint Sealer, Crack Repair, Adjusting Existing Utility Structures to Grade and other appurtenances necessary to complete the work will be considered incidental to these items and no additional compensation shall be made for those items of work.

Asphalt Pavement – Utility Trenches is for placement of asphalt as part of utility trench restoration for the fire water lines and electrical service. Asphalt pavement as part of plaza improvements will be paid under the applicable unit price bid item in the Schedule of Unit Prices.

The pay quantity shall be measured as tons of delivered material as measured by certified scale and scale tickets provided to the Owner for all material delivered and placed in accordance with the Drawings.

**BID ITEM 19: CONCRETE PAVEMENT (UTILITY TRENCHES) – SQUARE FEET**

This bid item will be measured by the square foot of placed concrete paving in areas as shown in the Drawings for utility trenching restoration. The unit price shall be full compensation for furnishing all labor, materials, tools, equipment, haul, disposal and all other costs and expenses necessary or incidental to place concrete paving including formwork, reinforcing, finishing, and scoring.

Concrete Pavement – Utility Trenches is for placement of concrete pavement as part of utility trench restoration for the fire water lines and electrical service. Concrete pavement as part of plaza improvements will be paid under the applicable unit price bid item in the Schedule of Unit Prices.

The pay quantity shall be calculated from the horizontal control points as shown in the Drawings or as altered by the Design Professional.

**BID ITEM 20: STORM DRAINAGE – LUMP SUM**

This bid item will be measured on a lump sum basis. The lump sum shall be full compensation for furnishing all materials, labor, tools, equipment and all other costs and expenses necessary for installation and testing of the storm drainage system including pipes, underdrains, catch basins, inlets, tide gate, fittings and appurtenances as shown in the Drawings.

This lump sum shall also be full compensation for furnishing all materials, labor, tools, equipment and all other costs and expenses necessary or incidental to prepare, excavate, backfill, trench, on-site haul, import, scarify, stockpile, load, place, grade, and compact up to the subgrade and other associated work required to conduct excavation or placement of imported material as shown in the Drawings for storm drainage elements including, but not limited to:

- A. Storm drainage pipe excavation, pipe zone bedding, backfill to subgrade.
- B. Underdrain pipe excavation, drain rock, permeable ballast, and backfill to subgrade.
- C. Storm structure excavation, placement of base, and backfill to subgrade.

**BID ITEM 21: SILVA CELL (OWNER PROVIDED) – LUMP SUM**

This bid item will be measured on a lump sum basis. The lump sum shall be full compensation for furnishing all materials, labor, tools, equipment and all other costs and expenses necessary for installation of the owner provided Silva Cell including but not limited to underdrains, geogrid, geofabric, concrete curb, silva cells, planting soil, base course bedding, fittings, and appurtenances as shown in the Drawings unless otherwise noted herein.

This lump sum shall also be full compensation for furnishing all materials, labor, tools, equipment and all other costs and expenses necessary or incidental to prepare, excavate, backfill, trench, on-site haul, import, scarify, stockpile, load, place, grade, and compact up to the subgrade and other associated work required to conduct excavation or placement of imported material as shown in the Drawings for the Silva Cell.

**BID ITEM 22: FIRE WATER (DOCK) – LUMP SUM**

This bid item will be measured on a lump sum basis. The lump sum shall be full compensation for furnishing all materials, labor, tools, equipment and all other costs and expenses necessary for installation and testing of the fire water system for the dock system including pipes, pipe supports and hangers, expansion joint, bulkhead penetration, fire department connection, hose connections, thrust blocks, hoses, fittings and appurtenances as shown in the Drawings for the dock's standpipe system. This bid item also includes furnishing and installing bollards, emergency telephone, standpipe signs, fire extinguishers and pedestals, fire laydown area striping, and bull rails.

This lump sum shall also be full compensation for furnishing all materials, labor, tools, equipment and all other costs and expenses necessary or incidental to prepare, excavate, backfill, trench, on-site haul, import, scarify, stockpile, load, place, grade, and compact up to the subgrade and other associated work required to conduct excavation or placement of imported material as shown in the Drawings for the dock fire water system. When fire water lines are installed in a common trench with other utilities, earthwork costs shall be apportioned equally among the utilities occupying the trench. The portion allocated to utilities other than the fire water line will be paid under the applicable bid items in the Schedule of Unit Prices.

**BID ITEM 23: FIRE WATER (BOILER BUILDING) – LUMP SUM**

This bid item will be measured on a lump sum basis. The lump sum shall be full compensation for furnishing all materials, labor, tools, equipment and all other costs and expenses necessary for installation and testing of the fire water lines for the Boiler Building including pipes, fire department connection, post indicator valve, thrust blocks, fittings and appurtenances as shown in the Drawings for the dock's standpipe system.

This lump sum shall also be full compensation for furnishing all materials, labor, tools, equipment and all other costs and expenses necessary or incidental to prepare, excavate, backfill, trench, on-site haul, import, scarify, stockpile, load, place, grade, and compact up to the subgrade and other associated work required to conduct excavation or placement of imported material as shown in the Drawings for the Boiler Building fire water system. When fire water lines are installed in a common trench with other utilities, earthwork costs shall be apportioned equally among the utilities occupying the trench. The portion allocated to utilities other than the fire water line will be paid under the applicable bid items in the Schedule of Unit Prices.

**BID ITEM 24: SANITARY SEWER – LUMP SUM**

This bid item will be measured on a lump sum basis. The lump sum shall be full compensation for furnishing all materials, labor, tools, equipment and all other costs and expenses necessary to furnish, install, and test the sanitary sewer conveyance lines and lift station including pipes, vaults, manholes, pumps, electrical conductors and conduits, controls, floats, guide rails, valves, fittings, and appurtenances as shown in the Drawings.

This lump sum shall also be full compensation for furnishing all materials, labor, tools, equipment and all other costs and expenses necessary or incidental to prepare, excavate, backfill, trench, on-site haul, import, scarify, stockpile, load, place, grade, and compact up to the subgrade and other associated work required to conduct excavation or placement of imported material as shown in the Drawings for sanitary sewer system including, but not limited to:

- A. Manhole and vault excavation, placement of base, and backfill to subgrade.

B. Sanitary sewer pipe excavation, pipe zone bedding, backfill to subgrade.

BID ITEM 25: DOMESTIC WATER – LUMP SUM

This bid item will be measured on a lump sum basis. The lump sum shall be full compensation for furnishing all materials, labor, tools, equipment and all other costs and expenses necessary for installation and testing of the domestic water lines including pipes, couplers, fittings and appurtenances as shown in the Drawings for restoring the Boiler Building domestic waterline. Earthwork for the domestic water line will be paid under the Earthwork - Cleanup Action Excavation bid item in the Schedule of Unit Prices.

BID ITEM 26: ELECTRICAL SERVICE – LUMP SUM

This bid item will be measured on a lump sum basis. The lump sum shall be full compensation for furnishing all materials, labor, tools, equipment and all other costs and expenses necessary for furnish and install conduits for the Boiler Building electrical service and communication line including connections to existing electrical equipment, conduits, fittings, and appurtenances as shown in the Drawings.

This lump sum shall also be full compensation for furnishing all materials, labor, tools, equipment and all other costs and expenses necessary or incidental to prepare, excavate, backfill, trench, on-site haul, import, scarify, stockpile, load, place, grade, and compact up to the subgrade and other associated work required to conduct excavation or placement of imported material as shown in the Drawings for Boiler Building electrical service and communication conduits.

BID ITEM 27: PLAZA LIGHT POLE – LUMP SUM

This bid item will be measured on a lump sum basis. The lump sum shall be full compensation for furnishing all materials, labor, tools, equipment and all other costs and expenses necessary for furnish, install, and test the light pole including electrical conduits, conductors, light pole foundation, light pole, and appurtenances as shown in the Drawings.

BID ITEM 28: IRRIGATION INTAKE SYSTEM – LUMP SUM

This bid item will be measured on a lump sum basis.

The lump sum price shall be full compensation for furnishing all labor, materials, tools, equipment, haul, disposal and all other costs and expenses necessary or incidental to construct the Irrigation Intake System, including but not limited to the irrigation intake and main line delivery pipe and appurtenances shown on Drawings I-001, I-010 through I-012, and I-020 through I-024; trenching, bedding, and backfill for irrigation intake and main line delivery pipe; trail restoration; bulkhead wall penetrations; pipe installation on the new dock; a new intake screen with a foot valve; a packaged irrigation pump station; an irrigation filter system in an enclosure; an infiltration trench for backwash water from the irrigation filter system; an electrical connection to the packaged irrigation pump system; miscellaneous fittings and boxes for connections to the existing irrigation main line; miscellaneous valves; a drain valve assembly on the dock near the intake screen; a flow meter in an irrigation box; replacement of the existing south shoreline irrigation main line; connections to existing quick couplers; and a backup connection to the City water main including the meter, valves and RPBA, as shown on the Drawings.

This bid item excludes demolition, earthwork beyond irrigation line trenching, soil disposal, crushed surfacing base course placed for plaza improvements or other surfaces, asphalt pavement, permeable paver surfacing, and storm drainage, which are covered by separate bid items.

Measurement for payment shall be on a Lump Sum basis. Payment shall constitute full compensation for all work described herein.

**BID ITEM 29: CONCRETE PAVEMENT – SQUARE FEET**

This bid item will be measured by the square foot of placed concrete paving as shown in the Drawings.

The unit price shall be full compensation for furnishing all labor, materials, tools, equipment, haul, disposal and all other costs and expenses necessary or incidental to place concrete paving including formwork, reinforcing, finishing, and scoring.

The pay quantity shall be calculated from the horizontal control points as shown in the Drawings or as altered by the Design Professional.

**BID ITEM 30: PERMEABLE PAVERS – SQUARE FEET**

This bid item will be measured by the square foot of placed Permeable Pavers as shown in the Drawings.

The unit price shall be full compensation for furnishing all labor, materials, tools, equipment, haul, disposal and all other costs and expenses necessary or incidental to place Permeable Pavers.

The pay quantity shall be calculated from the horizontal control points as shown in the Drawings or as altered by the Design Professional.

**BID ITEM 31: GRAVEL BASE AND BEDDING AND JOINT FILLER FOR PERMEABLE PAVERS – TONS**

This bid item will be measured by the ton of placed Gravel Base and Bedding and Joint Filler for Permeable Pavers as shown in the Drawings.

The unit price shall be full compensation for furnishing all labor, materials, tools, equipment, haul, disposal and all other costs and expenses necessary or incidental to place Gravel Base for Permeable Pavers, Bedding and Joint Filler sand as a bedding layer and between the joints of the Permeable Pavers, and geotextile for permeable pavers as shown on the drawings.

The pay quantity shall be calculated from the horizontal control points as shown in the Drawings or as altered by the Design Professional.

**BID ITEM 32: POLYMETRIC SAND – SQUARE FEET**

This bid item will be measured by the square foot of placed Polymetric Sand for permeable pavers as shown in the Drawings.

The unit price shall be full compensation for furnishing all labor, materials, tools, equipment, haul, disposal and all other costs and expenses necessary or incidental to place Polymetric Sand as bedding for Permeable Pavers and for joints between pavers, where pavers are to be installed above the existing concrete bulkhead wall tie back slab.

The pay quantity shall be calculated from the horizontal control points as shown in the Drawings or as altered by the Design Professional.

**BID ITEM 33: PERMEABLE PAVER BORDER – LINEAR FEET**

This bid item will be measured by the linear foot of constructed permeable paver boarder as shown in the Drawings.

The unit price shall be full compensation for furnishing all labor, materials, tools, equipment, haul, disposal and all other costs and expenses necessary or incidental to construct the permeable paver boarder including formwork, reinforcing, finishing, and joints.

The pay quantity shall be calculated from the horizontal control points as shown in the Drawings or as altered by the Design Professional.

**BID ITEM 34: CONCRETE THICKENED EDGE – LINEAR FEET**

This bid item will be measured by the linear foot of constructed Concrete Thickened Edge as shown in the Drawings.

The unit price shall be full compensation for furnishing all labor, materials, tools, equipment, haul, disposal and all other costs and expenses necessary or incidental to construct the Concrete Thickened Edge including formwork, reinforcing, finishing, and joints.

The pay quantity shall be calculated from the horizontal control points as shown in the Drawings or as altered by the Design Professional.

**BID ITEM 35: HABITAT GRAVEL – TONS**

This bid item will be measured by the ton of placed Habitat Gravel as shown in the Drawings.

The unit price shall be full compensation for furnishing all labor, materials, tools, equipment, haul, disposal and all other costs and expenses necessary or incidental to place Habitat Gravel.

The pay quantity shall be calculated from the horizontal control points as shown in the Drawings or as altered by the Design Professional.

**BID ITEM 36: CONCRETE STAIRS – LINEAR FEET**

This bid item will be measured by the linear foot at the face of the risers of concrete stairs as shown in the Drawings.

The unit price shall be full compensation for furnishing all labor, materials, tools, equipment, haul, disposal and all other costs and expenses necessary or incidental to construct the concrete stairs including formwork, reinforcing, finishing, and joints.

The pay quantity shall be calculated from the horizontal control points as shown in the Drawings or as altered by the Design Professional.

**BID ITEM 37: HANDRAIL AT CONCRETE STAIRS AND ADA RAMP – LINEAR FEET**



This bid item will be measured by the linear foot of handrail as shown in the Drawings.

The unit price shall be full compensation for furnishing all labor, materials, tools, equipment, haul, disposal and all other costs and expenses necessary or incidental to construct the handrail including fabrication, welding, installation, and painting.

The pay quantity shall be calculated from the horizontal control points as shown in the Drawings or as altered by the Design Professional.

**BID ITEM 38: ROCK TERRACES – LUMP SUM**

This bid item will be measured on a lump sum basis.

The lump sum price shall be full compensation for furnishing all labor, materials, tools, equipment, haul, disposal and all other costs and expenses necessary or incidental to install rock terraces including excavation and placement geotextile, gravel backfill, perforated underdrain pipe, drain rock, and rocks.

Measurement for payment shall be on a Lump Sum basis. Payment shall constitute full compensation for all work described herein.

**BID ITEM 39: GRAVEL PATHWAY AND DRIVEWAY – TON**

This bid item will be measured by the ton of placed Crushed Stone Surfacing as shown in the Drawings

The unit price shall be full compensation for furnishing all labor, materials, tools, equipment, haul, disposal and all other costs and expenses necessary or incidental to place Crushed Stone Surfacing, including crushed surfacing base course, crushed surfacing top course, and compaction.

The pay quantity shall be calculated from the horizontal control points as shown in the Drawings or as altered by the Design Professional.

**BID ITEM 40: BOULDERS – EACH**

This bid item will be measured by each boulder placed as shown in the Drawings.

The unit price shall be full compensation for furnishing all labor, materials, tools, equipment, haul, disposal and all other costs and expenses necessary or incidental to place boulders, including placement and compaction of crushed surfacing base course and placement of salvaged or imported boulders. In the event that existing boulders may be salvaged, salvaged boulders and imported boulders will be calculated separately.

The pay quantity shall be calculated for each boulder placed, as shown in the Drawings or as directed in the field by the Design Professional.

**BID ITEM 41: LARGE WOODY DEBRIS – EACH**

This bid item will be measured by each Large Woody Debris placed, as shown in the Drawings

The unit price shall be full compensation for furnishing all labor, materials, tools, equipment, haul, disposal, and all other costs and expenses necessary or incidental to place each piece of Large Woody Debris, including anchoring.

The pay quantity shall be calculated based on each piece of Large Woody Debris placed, as shown in the Drawings or as directed in the field by the Design Professional.

**BID ITEM 42: SITE FURNISHING AND SIGNS (OWNER PROVIDED) – LUMP SUM**

This bid item will be measured on a lump sum basis.

The lump sum shall be full compensation for furnishing all labor, materials, tools, equipment, haul, disposal and all other costs and expenses necessary or incidental to satisfactorily install owner provided site furnishings and signs. This lump sum price shall include the following items:

- A. Picnic table
- B. Benches
- C. Trash and Recycling Receptacles
- D. Kiosk
- E. Signs

Measurement for payment shall be on a Lump Sum basis. Payment will be made at the contract Lump Sum price as stated in the Bid and shall constitute full compensation for all work described herein.

**BID ITEM 43: MEDALLIONS (OWNER PROVIDED) – LUMP SUM**

This bid item will be measured on a lump sum basis.

The lump sum shall be full compensation for furnishing all labor, materials, tools, equipment, haul, disposal and all other costs and expenses necessary or incidental to satisfactorily install owner provided medallions, which will be embedded in the concrete paving placed in the plaza area, as shown on the Drawings.

Measurement for payment shall be on a Lump Sum basis. Payment will be made at the contract Lump Sum price as stated in the Bid and shall constitute full compensation for all work described herein.

**BID ITEM 44: INTERPRETIVE SIGN BRACKET – LUMP SUM**

This bid item will be measured on a lump sum basis.

The lump sum shall be full compensation for furnishing all labor, materials, tools, equipment, haul, disposal and all other costs and expenses necessary or incidental to satisfactorily construct and install the interpretive sign bracket on the existing bulkhead wall with owner provided interpretive sign, as shown on the Drawings.

Measurement for payment shall be on a Lump Sum basis. Payment will be made at the contract Lump Sum price as stated in the Bid and shall constitute full compensation for all work described herein.

**BID ITEM 45: IRRIGATION – LUMP SUM**

This bid item will be measured on a lump sum basis.

The lump sum shall be full compensation for furnishing all labor, materials, tools, equipment, haul, disposal, and all other costs and expenses necessary or incidental to construct the Irrigation System that will irrigate

new vegetation installed as part of the project, including but not limited to trenching, backfill, and installation of spray irrigation heads, lateral lines, miscellaneous fittings, valves, and boxes for irrigation system valves as shown on Drawings I-030 through I-031, I-040 through I-042.

This bid item excludes the irrigation intake system, irrigation main lines, and replacement of the south shoreline irrigation main line, which are covered by a separate bid item. This bid item also excludes demolition and earthwork beyond trenching for irrigation lines, which are covered by separate bid items.

Measurement for payment shall be on a Lump Sum basis. Payment shall constitute full compensation for all work described herein.

**BID ITEM 46: LANDSCAPE INCL. TOPSOILS, PLANTING AND PLANT MAINTENANCE FOR PLANT ESTABLISHMENT THROUGH PHYSICAL COMPLETION – LUMP SUM**

This bid item will be measured on a lump sum basis.

The lump sum shall be full compensation for furnishing all labor, materials, tools, equipment, haul, disposal and all other costs and expenses necessary or incidental to satisfactorily provide landscape maintenance through physical completion. This lump sum price shall be broken down to include at a minimum the following items:

- A. Imported topsoil
- B. All plantings
- C. Hydroseeding for lawn and stormwater conveyance areas
- D. Wood chip/bark mulch
- E. Tree staking
- F. Coir fabric and stakes
- G. Maintenance during plant warranty period

Measurement for payment shall be on a Lump Sum basis and shall include monthly updates on work complete. Payment will be made monthly at the contract Lump Sum price as stated in the Bid and shall constitute full compensation for all work described herein.

**BID ITEM 47: PIER AND DOCK DEMOLITION – LUMP SUM**

This Lump Sum unit price shall include full compensation for furnishing all labor, supervision, materials, tools, equipment, barges, cranes, temporary works, and incidentals necessary to demolish and remove the existing overwater concrete pier and dock structures, including but not limited to concrete deck, beams, pile caps, timber piles, hardware, and appurtenances, complete and in place, as shown on the Contract Documents and as directed by the Design Professional.

The work includes, but is not limited to, the following:

- A. Demolition Activities:

1. Controlled demolition of the existing concrete pier/dock structures and associated structural elements.
2. Cutting, breaking, removal, and extraction of concrete members, timber piles, pile caps, and embedded materials.
3. Removal of debris (in-water rubbish) above and below the waterline to the extents indicated in the Contract Documents.

B. Labor and Equipment:

1. All labor, supervision, and coordination required to safely perform demolition operations, including diving.
2. All equipment required, including cranes, barges, marine equipment, saws, breakers, and hauling equipment.

C. Environmental Protection and Best Management Practices (BMPs):

1. Implementation and maintenance of BMPs to prevent debris, sediment, and contaminants from entering the waterway.
2. Installation and removal of turbidity curtains, debris containment systems, and other temporary environmental controls as required.
3. Compliance with all applicable federal, state, and local environmental regulations and permits.

D. Temporary Storage:

1. Temporary on-site or off-site storage of demolished materials as required for sorting, handling, and disposal.
2. Protection of stored materials to prevent runoff, contamination, or environmental impact.

E. Disposal:

1. Loading, transportation, and lawful disposal or recycling of demolished materials at approved facilities.
2. Payment of all tipping fees, recycling fees, permits, and disposal costs.
3. Disposal of materials in accordance with applicable regulations and project requirements.

F. Incidental Work:

1. Protection of adjacent structures, utilities, and improvements.
2. Restoration of disturbed areas resulting from demolition activities.
3. Coordination with ongoing construction operations.

Measurement for payment shall be on a Lump Sum basis. Payment shall constitute full compensation for all work described herein, including labor, equipment, materials, BMPs, temporary storage, disposal, environmental compliance, and all incidental work necessary to complete the demolition of the existing overwater concrete pier and dock structures to the limits shown on the plans and removal of in-water rubbish.

**BID ITEM 48: GRATED OVERWATER PLATFORM – LUMP SUM**

This Lump Sum unit price shall include full compensation for furnishing all labor, supervision, materials, tools, equipment, barges, cranes, temporary works and shoring, shipping, storage and incidentals necessary to construct the grated overwater platform including but not limited to, steel detailing, fabrication, and erection of the steel framing, edge protection, and entrapment barrier, and FRP grating.

This bid item excludes steel piles and steel pile driving which are covered by separate bid items.

Measurement for payment shall be on a Lump Sum basis. Payment shall constitute full compensation for all work described herein necessary to construct the grated overwater platform.

**BID ITEM 49: EXISTING FIXED PIER REPAIR – LUMP SUM**

This Lump Sum unit price shall include full compensation for furnishing all labor, supervision, materials, tools, equipment, barges, cranes, temporary works and shoring, and incidentals necessary to repair the North Pier (existing fixed concrete pier) to remain, including, but not limited to, concrete deck repair, pile cap extraction and replacement, timber pile repair, timber pile FRP jacketing and grouting, hardware replacement and/or repair, new hardware installation, timber rub rails, bullrail replacements, mooring hardware (cleats, etc.), and appurtenances, complete and in place, as shown on the Contract Documents and as directed by the Design Professional.

Measurement for payment shall be on a Lump Sum basis. Payment shall constitute full compensation for the work described herein.

**BID ITEM 50: FIXED PIER GRATING – LUMP SUM**

This Lump Sum unit price shall include full compensation for furnishing all labor, supervision, materials, tools, equipment, barges, cranes, temporary works and shoring, shipping, storage, and incidentals necessary to construct fixed pier grating including but not limited to, steel detailing, fabrication, and erection of the steel framing, and FRP grating.

This bid item excludes timber pile cap extraction and replacement, which is covered by the existing fixed pier repair bid item.

Measurement for payment shall be on a Lump Sum basis. Payment shall constitute full compensation for the work described herein.

**BID ITEM 51: WAVE ATTENUATOR/MOORING FLOAT INCLUDING FINGER FLOATS, 60'-0" X 6'-0" ALUMINUM GANGWAY AND GANGWAY ABUTMENT – LUMP SUM**

This Lump Sum unit price shall include full compensation for furnishing all, labor, supervision, materials, tools, equipment, barges, cranes, temporary works and shoring, shipping, storage and incidentals necessary to engineer, design, construct, deliver, and install, the new Concrete Wave Attenuator/Mooring Float including

Finger Floats, including, but not limited to, engineering analysis and design, concrete float construction including any cast-in embedments required for the attachment of mooring cleats, rub rails, coordinated utility hangers for the fire water dry standpipe system, attachment of safety equipment such as portable fire extinguishers, rescue ladders, and life rings, ADA compliant transition plates, rub rails, steel bull rails at the fire protection staging areas, the 42"x25'-0" finger floats, concrete finishing, Aluminum Gangway and Gangway Abutment including welding to Steel Pile, and appurtenances, complete and in place, as shown or described in the Contract Documents and as directed by the Design Professional.

The gangway shall be of aluminum construction and shall include all structural members, FRP decking, handrails, guardrails, toe and/or kick plates and edge protection, transition plates, connection hardware, bearings, pins, shore lugs, drop links, rollers, hinges, anchorage, and accessories required for a complete and operational installation.

This bid item excludes Steel Piles and Steel Pile Driving which are covered by separate bid items.

Measurement for payment shall be on a Lump Sum basis. Payment shall constitute full compensation for all work described herein.

**BID ITEM 52: FLOATING SPECIAL PURPOSE DOCK INCLUDING FINGER FLOATS, ALUMINUM FRAMED ADA KAYAK LAUNCH, AND 32'-0" x 8'-0" ALUMINUM GANGWAY AND GANGWAY ABUTMENT – LUMP SUM**

This Lump Sum unit price shall include full compensation for furnishing all, labor, supervision, materials, tools, equipment, barges, cranes, temporary works and shoring, shipping, storage and incidentals necessary to engineer, design, construct, deliver, and install, the new Floating Special Purpose Dock including Finger Floats and Aluminum Framed ADA Kayak Launch, Aluminum Gangway and Gangway Abutment including welding to Steel Pile, including, but not limited to, engineering analysis and design, float construction including floatation tubs, metal framing, FRP grating, any hardware required for the attachment of mooring hardware, rub rails, transition plates, bumpers and rub rails, steel bull rails, the 36"x15'-0" kayak finger floats, aluminum framed ADA kayak launch, Aluminum Gangway and Gangway Abutment including welding to Steel Pile, and appurtenances, complete and in place, as shown or described in the Contract Documents and as directed by the Design Professional.

The gangway shall be of aluminum construction and shall include all structural members, FRP decking, handrails, guardrails, toe and/or kick plates and edge protection, transition plates, connection hardware, bearings, pins, shore lugs, drop links, rollers, hinges, anchorage, and accessories required for a complete and operational installation.

This bit item excludes steel piles and steel pile driving which are covered by separate bid items.

Measurement for payment shall be on a Lump Sum basis. Payment shall constitute full compensation for all work described herein.

**BID ITEM 53: "NO WAKE" AND "NON-MOTORIZED VESSELS" BUOYS – LUMP SUM**

This Lump Sum unit price shall include full compensation for furnishing all, labor, supervision, materials, tools, equipment, barges, cranes, temporary works and shoring, shipping, storage and incidentals necessary to

procure and install three new navigational aid buoys as shown on the plans, including helical anchorage and tether lines. Work also includes the removal of one existing buoy.

Measurement for payment shall be on a Lump Sum basis. Payment shall constitute full compensation for all work described herein.

**BID ITEM 54: STEEL PIPE PILE (16x0.625 - FLOATING SPECIAL PURPOSE FLOAT AND CITY DOCKS) – LINEAR FEET**

This Linear Foot unit price shall include full compensation for furnishing all, labor, supervision, materials, tools, equipment, barges, cranes, temporary works and shoring, shipping, storage and incidentals necessary to procure, fabricate, and deliver the 16-inch diameter Steel Pipe Piles with 0.625-inch wall thickness shown in the Drawings.

The unit Contract price per linear foot for Steel Pipe Pile – 16x0.625 shall be full pay for furnishing the steel pipe piles, including furnishing, fabricating, storage and delivery.

**BID ITEM 55: STEEL PIPE PILE (24x0.625 - WAVE ATTENUATOR/MOORING FLOAT) – LINEAR FEET**

This Linear Foot unit price shall include full compensation for furnishing all, labor, supervision, materials, tools, equipment, barges, cranes, temporary works and shoring, shipping, storage and incidentals necessary to procure, fabricate, and deliver the 24-inch diameter Steel Pipe Piles with 0.625-inch wall thickness shown in the Drawings.

The unit Contract price per linear foot for Steel Pipe Pile – 24x0.625 shall be full pay for furnishing the steel pipe piles, including furnishing, fabricating, storage and delivery.

**BID ITEM 56: STEEL PIPE PILE (6.625x0.375 - OVERWATER PLATFORM) – LINEAR FEET**

This Linear Foot unit price shall include full compensation for furnishing all, labor, supervision, materials, tools, equipment, barges, cranes, temporary works and shoring, shipping, storage and incidentals necessary to procure, fabricate, and deliver the 6.625-inch diameter Steel Pipe Piles with 0.375-inch wall thickness shown in the Drawings.

The unit Contract price per linear foot for Steel Pipe Pile – 6.625x0.375 shall be full pay for furnishing the steel pipe piles, including furnishing, fabricating, storage and delivery.

**BID ITEM 57: STEEL PILE DRIVING (16x0.625 - FLOATING SPECIAL PURPOSE FLOAT AND CITY DOCKS) – EACH**

This Linear Foot unit price shall include full compensation for furnishing all, labor, supervision, materials, tools, equipment, barges, cranes, temporary works and shoring, and incidentals necessary to drive the 16-inch diameter Steel Pipe Piles with 0.625-inch wall thickness shown in the Drawings. This work also includes cutting off or building up piles when required.

The unit Contract price per each for Steel Pile Driving – 16x0.625 shall be full pay for driving the pile to the minimum embedment (embed) depth or minimum tip elevation, whichever provides the greater total embedment as shown on the Drawings.

**BID ITEM 58: STEEL PILE DRIVING (24x0.625 - WAVE ATTENUATOR/MOORING FLOAT) – EACH**

This Linear Foot unit price shall include full compensation for furnishing all, labor, supervision, materials, tools, equipment, barges, cranes, temporary works and shoring, and incidentals necessary to drive the 24-inch diameter Steel Pipe Piles with 0.625-inch wall thickness shown in the Drawings. This work also includes cutting off or building up piles when required.

The unit Contract price per each for Steel Pile Driving – 24x0.625 shall be full pay for driving the pile to the minimum embedment (embed) depth or minimum tip elevation, whichever provides the greater total embedment as shown on the Drawings.

**BID ITEM 59: STEEL PILE DRIVING (6.625x0.375 - OVERWATER PLATFORM) – EACH**

This Linear Foot unit price shall include full compensation for furnishing all, labor, supervision, materials, tools, equipment, barges, cranes, temporary works and shoring, and incidentals necessary to drive the 6.625-inch diameter Steel Pipe Piles with 0.375-inch wall thickness shown in the Drawings. This work also includes cutting off or building up piles when required.

The unit Contract price per each for Steel Pile Driving – 6.625x0.375 shall be full pay for driving the pile to the minimum embedment (embed) depth or minimum tip elevation, whichever provides the greater total embedment as shown on the Drawings.

**PART 2 PRODUCTS**

(NOT USED)

**PART 3 EXECUTION**

(NOT USED)

**END OF SECTION**



## **01 23 00 ALTERNATES**

### **PART 1 GENERAL**

#### **1.01 RELATED DOCUMENTS**

- A. [00 41 13 BID FORM](#)
- B. Individual Sections related to specific Alternate Bid items.

#### **1.02 SUMMARY**

- A. This Section includes administrative and procedural requirements for alternates.
- B. General:
  - 1. Each Bidder shall state in their Bid, if there are spaces provided therefore in the [00 41 13 BID FORM](#)
    - a. Their proposal for performing the Work of the Base Bid.
    - b. Substitute Alternate proposals, stating the sums to be added to or deducted from the Base Bid for substituting materials and/or construction listed in this section.
    - c. Deductive Alternate proposals, stating the sums to be deducted from the Base Bid for deleting items of work listed in this section.
  - 2. Bid prices shall include adjustments in the work of all trades as may be necessary.
  - 3. Materials and specification section numbers listed in Alternate Bid descriptions below are general in nature and list only those materials and associated section numbers which are primary to each respective Alternative Bid, but are not intended to be all inclusive; Contractor shall provide all other materials and associated work necessary to complete the work of each respective Alternative Bid which is not otherwise specifically listed.

#### **1.03 DEFINITIONS**

- A. Base Bid: Includes all work indicated on Drawings and/or specified for all building and site construction work as designated and shown on Drawings and details, including earthwork, excepting only the work included in the Alternate Bids described in this section which result in additive or deductive costs.
- B. Alternative Bid: An amount proposed by Bidders and stated on the [BID FORM](#) for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if the City decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents. The cost or credit for each Alternate is the net addition to or deduction from the Contract Sum to incorporate the Alternate into the Work. No other adjustments are made to the Contract Sum.

#### **1.04 PROCEDURES**

- A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the Alternate into Project. Include as part of each Alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of the Alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each Alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.
- C. Execute accepted alternates under the same conditions as other Work of the Contract.
- D. Schedule: A Schedule of Alternates is included at the end of this Section. See **Divisions 02-35** for requirements for materials necessary to achieve the Work described under each Alternate.

## **PART 2 PRODUCTS**

(NOT USED)

## **PART 3 EXECUTION**

### **3.01 SCHEDULE OF ADDITIVE ALTERNATIVE BIDS**

- A. Additive Alternative Bid No. AA1: \_\_\_\_\_.

### **3.02 SCHEDULE OF SUBSTITUTE ALTERNATIVE BIDS**

- A. Substitute Alternative Bid No. SA1: \_\_\_\_\_.

### **3.03 SCHEDULE OF DEDUCTIVE ALTERNATIVE BIDS**

- A. Deductive Alternative Bid No. DA1: \_\_\_\_\_.

**END OF SECTION**

## **01 25 00 SUBSTITUTION PROCEDURES**

### **PART 1 GENERAL**

#### **1.01 RELATED DOCUMENTS**

- A. [00 43 25 SUBSTITUTION REQUEST FORM \(DURING BIDDING\)](#)
- B. [00 63 25 SUBSTITUTION REQUEST FORM \(DURING CONSTRUCTION\)](#)
- C. [01 32 00 CONSTRUCTION PROGRESS SCHEDULE AND REPORTING](#)

#### **1..02 SUMMARY**

- A. This section specifies administrative and procedural requirements for handling requests for substitutions made during Bidding and after award of the Contract.

#### **1.03 DEFINITIONS**

- A. Definitions used in this section are not intended to change or modify the meaning of other terms used in the Contract Documents.
- B. Substitutions: Requests for changes in products, materials, equipment, and methods of construction required by Contract Documents proposed by the Contractor after award of the Contract are considered requests for “substitutions.” The following are not considered substitutions:
  - 1. Revisions to Contract Documents requested by the City or Owner’s Representative.
  - 2. Specified options of products and construction methods included in Contract Documents.
  - 3. The Contractor’s determination of and compliance with governing regulations and orders issued by governing authorities.

#### **1.04 SUBMITTALS**

- A. Substitution Request Submittal During Bidding: Requests shall reach the City’s Representative’s office via email within the allotted time frame for questions. The City will be allotted a minimum of fourteen (14) calendar days to respond to substitution requests. If fourteen (14) calendar days are not allotted for review prior to the response date from the City's Pre-Bid Proposal Question deadline, then the request will be denied.
- B. Substitution Request Submittal During Bidding and During Construction:
  - 1. Use forms provided and referenced above.
  - 2. Requests for substitution may be considered or rejected at the discretion of the City. Submit digital copies when possible (PDF or similar) and three (3) copies when physical submissions are necessary (for items such as paint colors and finishes that cannot be accurately reviewed digitally), for each

request for substitution under consideration. Submit requests with procedures required for Change Order proposals.

3. Identify the product, fabrication, or installation method to be replaced in each request. Include relevant Specification Section and Drawing numbers. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:
  - a. Product Data, including Drawings and descriptions of products, fabrication and installation procedures
  - b. Samples, where applicable or requested
  - c. A detailed comparison of significant qualities of the proposed substitution with those of Work specified. Significant qualities may include elements such as size, weight, durability, performance, and visual effect
  - d. Possible conflicts
4. Owner's Representative's Action: Within seven (7) calendar days of receipt of the request for substitution, the Owner's Representative will request any additional information or documentation necessary for evaluation of the request. Within fourteen (14) calendar days of receipt of the request, or seven (7) calendar days of receipt of the additional information or documentation, whichever is later, the Owner's Representative will notify the Contractor of acceptance or rejection of the proposed substitution. If a decision on use of a proposed substitute cannot be made or obtained within the time allocated, use the product specified by name. Acceptance may be in the form of a Change Order.

## **PART 2 PRODUCTS**

### **2.01 SUBSTITUTIONS**

- A. Conditions: The Contractor's substitution request will be received and considered by the Owner's Representative when the substitution is in the best interest of the City, as determined by the City, and when one or more of the following conditions are satisfied, as determined by the Owner's Representative; otherwise, requests will be returned without action except to record noncompliance with these requirements.
  1. Proposed changes must be in keeping with the general intent of Contract Documents.
  2. The request must be timely, fully documented and properly submitted.
  3. Extensive revisions to Contract Documents must not be required.
  4. The request is directly related to an "or approved equal" or similar clause or similar language in the Contract Documents and requires a Substitution Request.

5. The specified product or method of construction cannot be provided within the Contract Time. The request will not be considered if the product or method cannot be provided as a result of failure to complete the Work promptly or coordinate activities properly. Written documentation of such unavailability and the cause shall be provided on the original manufacturers, fabricators or supplier's letterhead with a signature and contact telephone number for the company. Documentation only by the Contractor, subcontractor, local sales representative, or distributor is not acceptable.
  6. The specified product or method of construction cannot receive necessary approval by a governing authority; meet governing codes, ordinances, laws, utility standards or insurance requirements and the requested substitution can be approved.
  7. A substantial advantage is offered the City, in terms of cost, time, or other considerations of merit, after deducting offsetting responsibilities the City may be required to bear. Additional responsibilities for the City may include additional compensation to the Owner's Representative for redesign and evaluation services, increased cost of maintenance, or other construction by the City or separate Contractors, and similar considerations.
  8. Field verification or other information disclosed after the Bid Proposal indicates the specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.
  9. Field verification or other information disclosed after the Bid Proposal indicates the specified product or method of construction cannot be coordinated with other materials, and where the Contractor certifies that the proposed substitution can be coordinated.
  10. The specified product or method of construction cannot support a warranty required by the Contract Documents, and where the Contractor certifies that the proposed substitution will support, and the Contractor will provide, the required warranty.
  11. The manufacturer, fabricator, or supplier of the specified product is unable or unwilling to certify or guarantee the performance of specified product/system as specified, or the specified product fails UL, ICBO, ASTM, or similar standard certification test required by the specifications.
- B. The Contractor's submittal and City's Representative's acceptance of Shop Drawings, Product Data, or Samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

### **PART 3 EXECUTION**

(NOT USED)

**END OF SECTION**

## **01 26 00 CONTRACT MODIFICATION PROCEDURES**

### **PART 1 GENERAL**

#### **1.01 RELATED DOCUMENT**

- A. [00 63 33 ARCHITECT'S SUPPLEMENTAL INSTRUCTION FORM](#)
- B. [00 63 63 CHANGE ORDER FORM](#)
- C. [00 72 13 GENERAL CONDITIONS](#) for additional definitions and requirements.
- D. [00 73 43 INSTRUCTIONS FOR PREVAILING WAGE REQUIREMENTS](#)
- E. [01 32 00 CONSTRUCTION PROGRESS SCHEDULE AND REPORTING](#)
- F. [01 60 00 PRODUCTS REQUIREMENTS](#)

#### **1.02 SUMMARY**

- A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications including: Architect's (or Equivalent) Supplemental Instruction (ASI), Proposal Requests, Requests for Information (RFI), Change Orders (CO), Field Work Directive (FWD), and Construction Change Directives (CCD).
- B. In the event of a conflict between this Section and [00 72 13 GENERAL CONDITIONS](#), the requirements of Section 00 72 13 shall govern.

#### **1.03 INITIAL REQUIREMENTS**

- A. Designate in writing the names of authorized members of Contractor's organizations who accept changes in the work and are responsible for informing other workers of the authorized changes.
- B. At the beginning of the Project, the Contractor shall submit a breakdown of all applicable trade and class wage rates intended to be incorporated into this Project using form provided by the Owner.
- C. Submit verification of the above rates if requested by the Owner.

#### **1.04 DEFINITIONS**

- A. Architect's Supplemental Instructions: Work order, instructions, or interpretations, signed by Design Professional making minor changes in the Work not involving a change in Contract Sum or Contract Time.

#### **1.05 DESIGN PROFESSIONAL'S SUPPLEMENTAL INSTRUCTIONS**

- A. Design Professional will issue Architect's Supplemental Instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on Design Professional's standard form "Architect's Supplemental Instructions" or similar document as determined by the Owner.

1. Contractor must either:
  - a. Proceed upon receipt of response in No Cost/Time impact; or
  - b. Submit a Notice of Cost/Time within seven (7) calendar days of response date and shall not proceed to implement the change in the Work.
2. By proceeding without submitting a statement of impact Contractor agrees that there is no impact on the Contract Cost or Time.

## 1.06 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Design Professional will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
  1. Proposal Requests issued by Design Professional are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
  2. Within fourteen (14) calendar days after receipt of Proposal Request, submit Change Order Proposal, provided by Contractor, with a quote estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
    - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    - c. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting [00 63 63 CHANGE ORDER FORM](#) to Design Professional.
  1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
  2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
  3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.



4. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
5. Comply with requirements in [01 60 00 PRODUCT REQUIREMENTS](#) if the proposed change requires substitution of one product or system for product or system specified.
6. Submission of a Contractor-Initiated Proposal does not relieve Contractor from compliance with the notice, cost substantiation, schedule analysis, and timing requirements of [00 72 13 GENERAL CONDITIONS](#), including provisions governing Requests for Change Order and waiver of claims.

#### **1.07 REQUEST FOR INFORMATION (RFI)**

- A. RFI Process: During the construction phase, the Contractor shall utilize the [00 63 13 REQUEST FOR INFORMATION FORM](#) to make inquiries for clarification of the Contract Documents. The Contractor shall make every reasonable effort to carefully review the contract documents and search for answers prior to sending an RFI to the Design Professional. When RFIs are transmitted, they shall be sent to the Design Professional in a timely fashion allowing a reasonable time frame for review and response by the design team. The Design Professional will judge whether they or their consultants would most appropriately answer the question. The Contractor is encouraged to forward proposed solutions to any issues identified along with the RFI to help expedite an answer and/or resolution. The Design Professional will return completed form to the Contractor in a timely fashion, and the Contractor shall forward on to appropriate subcontractors and suppliers. Such response to RFIs by the Design Professional and/or their consultants shall not constitute approval of a change in contract time or the contract sum. Changes in contract time or cost shall be handled via a Change Order or Construction Change Directive. If the Contractor feels the issue identified in the RFI will result in a change to the Contract Time or Sum, they shall so indicate on the RFI form. Such indication shall not automatically entitle the Contractor to an increase in the Contract Time or Contract Sum. If the Contractor feels a change to the Contract Time or Contract Sum is necessary as a result of the issue identified in the RFI, they shall submit full substantiating documentation to the Design Professional within the time frames indicated in the General Conditions for a Claim. Without such documentation in the required time frames, there will be no consideration of a change to the Contract Time or the Contract Sum.
- B. RFI Response Time: The RFI will generally be answered within fifteen (15) calendar days (as defined by the General Conditions). If the Design Professional determines that the RFI is incomplete, unclear, or requires further information to answer, this time frame will increase to provide the full fifteen (15) calendar days indicated upon receipt of all required information. The Design Professional and its Consultants will endeavor to respond appropriately to time critical questions. The Contractor shall only mark the RFI Time Critical (or urgent) in rare instances and only when absolutely necessary. Indication of a "Requested Return Date" with a time frame shorter than the above time frames will not be grounds for a contract time extension or delay claim. The Design Professional will endeavor to meet

the requested date provided the Contractor does not routinely request quicker responses. The Contractor shall endeavor to plan the project work such that RFIs do not commonly become time critical. The time frame will begin upon receipt in the Design Professional's office on a normal working day (e.g. between the hours of 8:00 AM and 5:00 PM) and will end upon the Design Professional's transmission back to the Contractor on a normal working day for the Design Professional. No adjustments to the Contract Time will be considered for RFIs answered within the above time frame.

- C. Quantity of RFIs: The Contractor should expect that a large number of RFIs may be necessary to complete the Work. The number of RFIs shall not be the basis of a claim for an increase in the Contract Time or the Contract Sum. The Contractor shall include all associated costs for processing these RFIs in their Bid, and for the time impacts (if any) in the project schedule.
- D. Form of Transmittal: Contractor shall digitally transmit RFIs.
- E. Unnecessary RFIs: Should the Contractor submit unnecessary RFIs, the City may charge the Contractor for the time to review and respond to the Contractor. This review time includes the City, Design Professional, and the Design Professional's Consultants. Time will be charged at \$125 per hour plus expenses. A change order will be processed deducting these costs from the Contract Sum. An "Unnecessary RFI", as determined by the Design Professional, shall be defined as a RFI question that could have been answered by the Contractor or a Subcontractor prior to submission of the RFI via review of information already contained in the Contract Documents. RFIs that are not clear or contain inadequate information to allow full review shall also be considered Unnecessary RFIs.
- F. RFI Numbering: RFIs shall be consecutively numbered, beginning at "1." The number shall be followed by a capital letter designating the primary discipline associated with the question. If a follow-up question arises, the follow-up RFI shall use the same number as the original RFI, but shall contain a sub-letter(s), beginning with a lower case "a." As an example, if the third RFI were mechanical in nature, it would be numbered 3M, and a clarification to RFI 3M would be RFI 3Ma.
- G. Subcontractor RFIs:
  - 1. General Requirements: Subcontractors shall also use an RFI form to request information or clarifications. The RFI form format is up to the General Contractor and Subcontractor to determine, but shall contain substantially the same information that the [00 63 13 REQUEST FOR INFORMATION FORM](#) contains. The City and Design Professional reserve the right to reject the subcontractor RFI format should it not contain substantially the same information as the [00 63 13 REQUEST FOR INFORMATION FORM](#).
  - 2. Numbering: Subcontractors shall number their RFIs using a letter in front of the number to designate their discipline, and shall also use a lower case letter after the number to indicate any follow-up questions. Use the following designation to identify each discipline:
    - a. Civil = "C"

- b. Electrical = "E"
- c. HVAC = "H"
- d. Landscape and Irrigation = "L"
- e. Plumbing = "P"
- f. Structural = "S"
- g. Example: The fourth Civil RFI would be numbered, 4C, and, if there were a follow-up question, it would be 4Ca.

3. General Contractor's Review: The General Contractor shall review and respond to all Subcontractor's RFIs. When the General Contractor has reviewed the RFI, and cannot find an answer in the Contract Documents, the General Contractor shall create their own RFI with the appropriate number, attach the subcontractor RFI, and forward it to the Design Professional. Should the Design Professional find the RFI to be "Unnecessary" as defined herein, review charges will be applied.

- H. RFI Documentation: RFI forms shall be fully completed, shall contain accurate references to drawings and specifications, shall include any necessary supporting data to make clear the question or concern, and shall contain the Contractor's proposed solution where feasible to recommend one.

## 1.08 CHANGE ORDERS

- A. [00 72 13 GENERAL CONDITIONS](#) for additional definitions and requirements.
- B. On Owner's approval of a Change Order Proposal or Construction Change Directive (CCD), Design Professional will issue a Change Order for signatures of Owner and Contractor on Design Professional's standard form, or similar document as determined by the Owner.
- C. Owner-approved Change Order Proposals may be grouped together for processing in a Change Order, as agreed upon by both Owner and Contractor.
- D. All agreed-upon Change Orders shall be deemed full and final settlement of any and all claims of any kind, including without limitation those for direct or indirect costs or damages or for extension of time, relating to the subject matter of such Change Order.

## 1.09 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Design Professional may issue a Construction Change Directive on Design Professional's standard form, or similar document as determined by the Owner. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
  2. Contractor must proceed immediately.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

#### **1.10 DOCUMENTATION OF PROPOSALS AND CLAIMS**

- A. [00 72 13 GENERAL CONDITIONS](#) for additional definitions and requirements.
- B. Support each lump sum proposal quotation and each unit price (not previously established) with sufficient substantiating data.
- C. On request, provide additional data to support time and cost computations:
1. Labor required, hours, hourly rate
  2. Equipment required
  3. Products required
    - a. Recommended source of purchase and unit cost
    - b. Quantities required of each material
    - c. Material unit costs and extended price
  4. Taxes, insurance, and bonds
  5. Documented credit for work deleted from Contract
  6. Overhead and profit – See General Conditions.
  7. Justification for any change in Contract Time
- D. Support each claim for additional costs, and time and material/force account work with documentation, as required for lump sum proposal. Include additional information:
1. Name of Owner's authorized agent who ordered work, and date of order
  2. Dates and times work was performed, and by whom
  3. Time record, summary of hours worked, and hourly rates paid
  4. Receipts and invoices for:
    - a. Equipment used, listing dates and times of use
    - b. Products used, listing of quantities

c. Subcontracts

**PART 2 PRODUCTS**

Not Used

**PART 3 EXECUTION**

(NOT USED)

**END OF SECTION**

## **01 29 00 PAYMENT PROCEDURES**

### **PART 1 GENERAL**

#### **1.01 RELATED DOCUMENTS**

- A. [00 61 16 PAYMENT BOND FORM](#)
- B. [00 61 19 PERFORMANCE BOND FORM](#)
- C. [00 62 76 PAYMENT APPLICATION FORM](#)
- D. [01 26 00 CONTRACT MODIFICATION PROCEDURES](#) for administrative procedures for handling changes to the Contract.
- E. [01 32 00 CONSTRUCTION PROGRESS SCHEDULE AND REPORTING](#) for administrative requirements governing preparation of, contents of, and submittal of schedules.
- F. [01 33 00 SUBMITTAL PROCEDURES](#) for information related to the Submittal Schedule.
- G. [01 77 00 CLOSEOUT PROCEDURES](#)

#### **1.02 SUMMARY**

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

#### **1.03 SCHEDULE OF VALUES**

- A. Submit the Schedule of Values to the Owner's Representative at the earliest possible date but no later than fourteen (14) calendar days after Contract execution.
- B. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.
- C. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.
  - 1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:
    - a. Contractor's Construction Schedule
    - b. Application for Payment forms, including Continuation Sheets
    - c. List of subcontractors
    - d. Schedule of allowances, if any
    - e. Schedule of alternates

- f. List of products
  - g. List of principal suppliers and fabricators
  - h. Schedule of submittals
2. Sub-schedules: Where the Work is separated into phases requiring separately phased payments, provide sub-schedules showing values correlated with each phase of payment.
- D. Format and Content: Use the Project Manual table of contents as a guide to establish the format for the Schedule of Values.
- 1. Provide at least one line item for each Specification Section, and at least one item for all pertinent activities as set forth on the Schedule of Values List at the end of this Section, and relating directly to the pertinent applicable activities of the CPM Schedule.
    - a. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports.
    - b. Provide several line items for principal subcontract amounts, where appropriate.
    - c. Include the O & M Manual and As-Builts as line items for each section.
    - d. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
      - i. Differentiate between items stored on-site and items stored off-site. Include evidence of insurance or bonded warehousing if required.
    - e. Provide a separate line item on the Schedule of Values for "Punch List Work" as indicated in the General Conditions. Provide separate line items for Punchlist Work for the General Contractor (which is to cover the General Contractor and all subcontractors except mechanical and electrical), Mechanical and Electrical subcontractors with the total of the three lines equally one percent as noted above. This amount will not be released until Final Completion is reached, including both actual work items and close-out submittals.
    - f. Provide separate line items for "Mobilization," "Commissioning," and "Punch List" as provided for in the [00 72 13 GENERAL CONDITIONS](#), including the specific line item percentages required therein.
    - g. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

- h. Allowances: Provide a separate line item in the Schedule of Values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
  - i. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
    - I. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.
    - II. Include in each line item a directly proportionate amount of Contractor's overhead and profit.
2. Identification: Include the following Project identification on the Schedule of Values:
- a. Project name and location
  - b. Name of Owner's Representative
  - c. City's contract number
  - d. Contractor's name and address
  - e. Date of submittal
3. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
- a. Related Specification Section or Division
  - b. Description of the Work
  - c. Name of subcontractor
  - d. Change Orders (numbers) that affect value
  - e. Dollar value:
    - i. Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100%.
    - ii. The sum of total scheduled costs should equal the Award Contract Price, rounded to whole figures.
4. The City reserves the right to reject the Schedule of Values if the City determines that it is front loaded or otherwise does not reasonably approximate the anticipated cost of the identified line items.

#### **1.04 APPLICATIONS FOR PAYMENT**



A. General

1. Submit itemized payment request as required in [00 72 13 GENERAL CONDITIONS](#), Payment, together with Schedule of Values and other submittals as listed herein.
2. Except as otherwise indicated, sequence of progress payments is to be regular, and each must be consistent with previous applications and payments; it is recognized that certain applications involve extra requirements, including initial application, application at times of Substantial Completion, and final payment application.
3. The Contractor certifies that to the best of their knowledge, information, and belief, the Work covered by each Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by them for work for which previous Applications for Payment were issued and payments received from the City, and that current payment is now due.
4. Other stipulations: As indicated in the [00 72 13 GENERAL CONDITIONS](#), Payment and Retainage.

B. Each Application for Payment shall be consistent with previous applications and payments as certified by the Owner's Representative and paid for by City.

1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

C. Payment Application Times: The date for each progress payment is indicated in the Agreement between City and Contractor, and as stipulated in [00 72 13 GENERAL CONDITIONS](#), the period of construction Work covered by each Application for Payment is the period indicated in the Agreement.

D. Payment-Application Forms: Refer to [00 62 76 PAYMENT APPLICATION FORM](#).

1. This Certificate is not negotiable. The amount certified is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the City or Contractor under this Contract.

E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Owner's Representative will return incomplete applications without action.

1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
3. Summary of dollar values to agree with respective total indicated on continuation sheets, if used. On continuation sheets, indicate:

- a. Fill in all scheduled component work items completely. Show item number/scheduled dollar value/item/schedule of values.
  - b. Fill in dollar value in each column for each scheduled line item.
  - c. If no work has been performed, enter zero (0).
  - d. At end of continuation sheets, list each change order approved prior to submission date. Also list each by change order number and description. Show and calculate for all other scheduled component items of work.
4. Signature of responsible officer of Contractor
  5. Responsibility for delay of payment due to incomplete, inaccurate or incorrect forms shall be the Contractor's
- F. Transmittal: Submit one (1) signed and notarized Application for Payment to Owner's Representative by email. Include waivers of lien and similar attachments if required.
- G. Initial Application for Payment: Failure to submit any of the following is sufficient grounds to withhold processing the Application for Payment. Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors
  2. List of principal suppliers and fabricators
  3. Approved Schedule of Values
  4. Approved Contractor's Construction Schedule
  5. Schedule of principal products and submittals
  6. Schedule of unit prices
  7. List of Contractor's staff assignments
  8. Copies of any building permits, authorizations and licenses to be obtained by the Contractor from governing authorities for performance of the Work
  9. Certificates of insurance and insurance policies not previously required or filed
  10. Statement of Intent to pay prevailing wages on Public Works Contracts
    - a. Statements of Intent to Pay Prevailing Wages meeting the requirements of the Revised Code of Washington (RCW) section 39.12.040 must be submitted to the Owner's Representative for each contractor and subcontractor.

- b. Statement that prevailing wages have been paid in accordance with the pre-filed statements of prevailing wages submitted to the Owner's Representative.
- c. A list of subcontractors must accompany each invoice submitted for payment. New subcontractors must be separately identified on the list of subcontractors and must have submitted their Intent to Pay Prevailing Wages document to the Owner's Representative.

11. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work

12. Initial progress report

13. Report of preconstruction conference

14. Performance and payment bonds

15. Initial settlement survey and damage report if required

16. Include certified payroll and statement of compliance

17. Other documents as may be required in the Contract Documents

H. Notarized Statement of Payment to Subcontractors:

- 1. All copies of all Applications for Payment, with the exception of the first, shall be accompanied by a written statement on the Contractor's letterhead reading as follows:
  - a. This letter is to certify that all subcontractors and suppliers have been paid to the degree of their interests as stated in the last Application for Payment submitted, withholding only the retainage applicable. Receipts listing the actual amount paid, signed by an officer of the business entity paid, are attached for all principal subcontractors and suppliers. Said receipts also state and represent that all sub-subcontractors, suppliers, wages, taxes and fringe benefits related to the subcontract have been paid in full to the degree their interests were stated in the last Application for Payment.
- 2. The names of those subcontractors for which applicable services are being billed must be identified on each application for payment, with description of work performed.
- 3. Each statement shall be notarized over an original signature of an officer of the Contractor authorized to represent it in legal and financial matters.
- 4. After the first Application for Payment, no further Applications will be processed without the notarized statement and receipts concerning payment to subcontractors.

- I. Applications each Month During Construction: Submit itemized application, each with Contractor's notarized affidavit and signed receipts from Principal Subcontractors and Suppliers as specified below. Also include updated construction schedule with each application, when required herein.

- J. Construction Schedule Update: If changes have occurred in the project schedule, submit with applications for payment a revised updated project CPM schedule.
- K. Schedule Of Values Updating: Update and resubmit the Schedule of Values before the next Application for Payment when Change Orders or Construction Change Directives result in a change in the contract Sum.
- L. Current Record Documents: Prior to acting on processing each monthly request for payment, Contractor is required to present for review to City and Consultants, a current set of Record Documents indicating any revisions and locating all hidden work with horizontal and vertical dimensions. Failure to keep record documents current to Owner's Representative's satisfaction shall be considered grounds for withholding progress payment and/or final payment to the Contractor.
- M. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100% completion for the portion of the Work claimed as substantially complete, with the exception of any items indicated to be held until Final Completion.
  - 1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
  - 2. This application shall reflect Certificates of Partial Substantial Completion issued previously for City occupancy of designated portions of the Work.
  - 3. Occupancy permits and similar agency approvals.
  - 4. List of incomplete work recognized as exceptions to the Owner's Representative's Certificate of Substantial Completion.
- N. Final Payment Application: Administrative actions and submittals that must be submitted to the City through the Owner's Representative prior to the time of Application for Payment at Final Completion are set forth below. Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
  - 1. Contractor's letter stating all work on Substantial Completion Punchlist has been fully completed, as well as all other known Work items
  - 2. Evidence of completion of Project closeout requirements
  - 3. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid
  - 4. Updated final statement, accounting for final changes to the Contract Sum
  - 5. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims"

6. AIA Document G707, "Consent of Surety to Final Payment"
7. City Template, "Release of Lien"
8. Evidence that claims have been settled
9. Signed receipt of transmittal of required Project construction records to the City
10. Property survey if required by Contract Documents
11. Removal of temporary facilities and services, if not previously accomplished
12. Removal of surplus materials, rubbish and similar elements
13. Project Permit Drawings and related documents including copies of the signed off permit sheets
14. All final submittals shall be submitted at the same time. Partial submittals will not be processed
15. Final meter readings for utilities, a measured record of stored fuel, and similar data as date of Substantial Completion or when City took possession of and assumed responsibility for corresponding elements of the Work

O. Final approval from utility agencies is required.

#### **1.05 PAYMENT FOR STORED MATERIAL**

- A. Payment for stored items will be subject to the following:
1. On-Site Materials: Progress payments shall be made for permanent materials and equipment to be incorporated in the Work and properly protected and stored on the project site with invoices from the original supplier provided to substantiate the value.
  2. Off-Site Materials: No payment will be made for materials stored off site, unless otherwise allowed in the General or Supplementary Conditions.
- B. Stored items may be included in monthly application for payment only after drawing and data submittals, if any are required, have been completed per Contract Documents.
- C. Partial payment for materials and equipment in advance of installation shall not constitute acceptance thereof and will not relieve Contractor of full responsibility for condition and subsequent acceptance by the City. Faulty materials discovered will be rejected even though partial payment may have been made.

## **PART 2 PRODUCTS**

(NOT USED)

## **PART 3 EXECUTION**

### **3.01 SCHEDULE OF VALUES LISTING**

- A. The following listing shall be used by the Contractor as a minimum breakdown for Schedule of Values required for this Project, with the exception of listed items not included in this Project:
1. Contractor Overhead
  2. Mobilization (See General Conditions for maximum allowed percentage)
  3. Bonds/Insurances (actual amounts)
  4. General Submittals (all except mechanical and electrical)
  5. General Punch List & Closeout (See General Conditions for maximum allowed percentage)
  6. Project Commissioning (See General Conditions for maximum allowed percentage)
  7. Temporary Facilities
  8. Supervision
  9. Survey & Layout
  10. Site Clearing & Preparation
  11. Site Demolition
  12. Building Excavation
  13. Building Backfill, Structural Fill, and Related Grading
  14. Finish Grading
  15. Asphalt Paving & Pavement Markings
  16. Paving Sub-base
  17. Site Vehicular Signage
  18. Site Monument Sign
  19. Site Concrete Work (walks, etc.)
  20. Gas Service
  21. Sanitary Sewer
  22. Storm Sewer
  23. Fire Water System
  24. Landscaping Materials
  25. Landscaping Labor
  26. Landscaping Irrigation Materials

- 27. Landscaping Irrigation Labor
- 28. Decorative Fencing & Gates
- 29. Misc. Site Items (bollards, sleeving, etc.)
- 30. Concrete Reinforcement
- 31. Concrete Foundations
- 32. Concrete Slabs on Grade
- 33. Concrete - Elevated Slabs
- 34. Concrete - Misc.
- 35. Grouts & Underlayments
- 36. Structural Steel Materials
- 37. Structural Steel Labor
- 38. Miscellaneous Steel Fabrications & Railings Materials
- 39. Miscellaneous Steel Fabrications & Railings Labor
- 40. Glued-Laminated Beams
- 41. Wood Decking
- 42. Rough Carpentry Materials (other than trusses)
- 43. Rough Carpentry Labor
- 44. Floor Truss Materials
- 45. Floor Truss Labor
- 46. Roof Truss Materials
- 47. Roof Truss Labor
- 48. Finish Carpentry Materials
- 49. Finish Carpentry Labor
- 50. Siding Materials
- 51. Siding Labor
- 52. Building Wrap & Underlayments
- 53. Dampproofing

- 54. Waterproofing
- 55. Traffic Coating
- 56. Insulation - Roof
- 57. Insulation - Walls
- 58. Insulation - Foundation
- 59. Metal Roofing Materials
- 60. Metal Roofing Labor
- 61. Roofing Underlayments
- 62. Single Ply Roofing and Green Roof System
- 63. Flashings & Sheet Metal
- 64. Firestopping
- 65. Roof Accessories
- 66. Sealants
- 67. Hollow Metal Materials
- 68. Hollow Metal Labor
- 69. Aluminum Storefront Systems
- 70. Wood Doors
- 71. Access Doors
- 72. O.H. Coiling Doors
- 73. Finish Hardware Materials
- 74. Finish Hardware Labor
- 75. Glass & Glazing
- 76. Interior Gypsum Wallboard
- 77. Ceramic Tile
- 78. Acoustical Ceilings
- 79. Carpet
- 80. Resilient Flooring and Base



- 81. Interior Painting
- 82. Exterior Painting
- 83. Wall Coverings
- 84. Toilet Partitions & Accessories
- 85. Louvers
- 86. Signage
- 87. Fire Extinguishers & Cabinets
- 88. Room Accessories
- 89. Blinds
- 90. Flagpoles & Accessories
- 91. Casework
- 92. Elevator
- 93. Misc. Specialties
- 94. Mechanical Mobilization (see percentages listed above)
- 95. Mechanical Permits/Bonds/Insurances (actual amounts)
- 96. Mechanical Submittals
- 97. Mechanical Punch List (see percentages listed above)
- 98. Mechanical Closeout (see percentages listed above)
- 99. Pipe Insulation Material
- 100. Pipe Insulation Labor
- 101. HVAC Insulation Material
- 102. HVAC Insulation Labor
- 103. Plumbing Below-Grade Materials
- 104. Plumbing Below-Grade Labor
- 105. Plumbing Rough-in Materials
- 106. Plumbing Rough-in Labor
- 107. Plumbing Fixtures Materials

- 108. Plumbing Fixtures Labor
- 109. Fire Sprinkler Engineering
- 110. Fire Sprinkler Shop Dwgs, Permit, Submittals
- 111. Fire Sprinkler Materials
- 112. Fire Sprinkler Labor
- 113. Hydronic Piping Materials
- 114. Hydronic Piping Labor
- 115. Hydronic Equipment Materials
- 116. Hydronic Equipment Labor
- 117. Hydronic System Flush
- 118. Hydronic Chemical Treatment
- 119. HVAC Equipment Materials
- 120. HVAC Equipment Labor
- 121. HVAC Ductwork Materials
- 122. HVAC Ductwork Labor
- 123. HVAC Labor
- 124. HVAC Finish
- 125. Control System Engineering
- 126. Control System Materials
- 127. Control System Labor
- 128. Testing, Adjustments and Balancing
- 129. Mobilization
- 130. Submittals
- 131. Electrical Permit
- 132. Electrical Site - Utility Provisions, Material
- 133. Electrical Site - Utility Provisions, Labor
- 134. Electrical Site - Site Lighting Rough In, Material

- 135. Electrical Site - Site Lighting Rough In, Labor
- 136. Electrical Site - Power and Low Voltage, Material
- 137. Electrical Site - Power and Low Voltage, Labor
- 138. Generator - Material
- 139. Generator - Labor
- 140. Lighting Systems - Fixtures & Lamps Material
- 141. Lighting Systems - Fixtures & Lamps Labor
- 142. Lighting Systems - Branch Circuit Rough-in, Material
- 143. Lighting Systems - Branch Circuit Rough-in, Labor
- 144. Lighting Systems - Branch Circuit Wiring Rough-in, Material
- 145. Lighting Systems - Branch Circuit Wiring Labor
- 146. Lighting Systems - Devices & Trim, Material
- 147. Lighting Systems - Devices & Trim, Labor
- 148. Power Systems - Switchgear, Disconnects, Material
- 149. Power Systems - Switchgear, Disconnects, Labor
- 150. Power Systems - Feeder Rough-in, Material
- 151. Power Systems - Feeder Rough-in, Labor
- 152. Power Systems - Equipment Connections
- 153. Power Systems - Branch Circuit Rough-in, Material
- 154. Power Systems - Branch Circuit Rough-in, Labor
- 155. Power Systems - Branch Circuit Wiring Rough-in, Material
- 156. Power Systems - Branch Circuit Wiring, Labor
- 157. Power Systems - Devices & Trim, Material & Labor
- 158. Power Systems - Devices & Trim, Labor
- 159. Low Voltage - Fire Alarm Rough-in, Material
- 160. Low Voltage - Fire Alarm Rough-in, Labor
- 161. Low Voltage - Fire Alarm Trim, Material

- 162. Low Voltage - Fire Alarm Trim, Labor
- 163. Low Voltage - Telecommunications Pathway, Rough-in Material
- 164. Low Voltage - Telecommunications Pathway, Rough-in Labor
- 165. Low Voltage - Telecommunications Premises Wiring, Material
- 166. Low Voltage - CATV, Material
- 167. Low Voltage - CATV, Labor
- 168. Low Voltage - Intrusion Alarm Rough-in Material
- 169. Low Voltage - Intrusion Alarm Rough-in Labor
- 170. Low Voltage - Security System Material
- 171. Low Voltage - Security System Labor
- 172. Low Voltage - CCTV Material
- 173. Low Voltage - CCTV Labor
- 174. Punch List & Closeout

**END OF SECTION**

## **01 29 73 SCHEDULE OF VALUES**

### **PART 1 GENERAL**

#### **1.01 SUMMARY**

- A. Section Includes: Administrative and procedural requirements for processing and submitting Schedule of Values.
- B. Related Requirements:
  - 1. [DIVISION 00 BIDDING, CONTRACT, AND CONDITIONS](#) for conditions of the Contract for additional requirements relating to provisions of this Section.
  - 2. [01 32 00 CONSTRUCTION PROGRESS SCHEDULE AND REPORTING](#)
  - 3. [01 33 00 SUBMITTAL PROCEDURES](#)
  - 4. [01 74 19 CONSTRUCTION WASTE MANAGEMENT](#)
  - 5. [01 77 00 CLOSEOUT PROCEDURES](#)
  - 6. [01 78 39 PROJECT RECORD DOCUMENTS \(AS BUILTS AND RECORD SET\)](#)

#### **1.02 SCHEDULE OF VALUES SUBMITTAL PROCEEDURES**

- A. Submit a Schedule of Values for review by the Design Professional and the Owner within 14 days after Contract execution and no less than 30 days prior to submittal of first Application for Payment.
- B. Submit updated Schedule of Values with each subsequent Application for Payment.
- C. Submit revised Schedule of Values reflecting Owner accepted Change Orders and other Modifications to Contract that affect Contract Sum or Contract Time.
- D. The Owner reserves right to reject Schedule of Values submittals that appear front loaded or do not reasonably approximate anticipated cost of identified line items.

#### **1.03 FORMAT**

- A. Forms: AIA Form G703 – Application and Certificate for Payment Continuation Sheet, electronic media facsimile, or forms as accepted by the Owner.
- B. Format Size: 8-1/2 inch by 11 inch or 11 inch by 17 inch.

#### **1.04 GENERAL REQUIREMENTS**

- A. Maintain Schedule of Values as basis for supporting Application for Payment amounts requested for each progress payment.
- B. Correlate corresponding items listed by Schedule of Values line items with other required administrative schedules and forms, including:

1. Contractor's Construction Progress Schedule
2. Application for Payment forms, including Continuation Sheets – Correlate Schedule of Values line items to that listed by Application for Payment:
  - a. Correspond to indirect costs and margins on actual cost
  - b. Make amounts for total cost and overhead and profit complete and proportionate
  - c. Include overhead and profit as a single line item
3. List of subcontractors
4. List of principal suppliers and fabricators
5. Schedule of submittals and list of products
- C. Use as basis for determining dollar value amount for each work activity and component of work for duration of Project.
- D. Make Schedule of Values total sum equal to current Contract Sum.
- E. Round-off figures to nearest dollar amount.
- F. Identify Schedule of Value line items by corresponding Section Titles in Project Manual Table of Contents.
- G. Break down major portion of work by areas, disciplines, phase, systems, or as appropriate for ease of review.
- H. For work that exceeds 1% of Contract Sum, break out separate line items according to major work activities, components, products, or operations.

#### **1.05 CONTENT**

- A. Identification: Include the following Project identification on the Schedule of Values:
  1. Project name and location
  2. Owner's name
  3. Name of the Design Professional
  4. Project number
  5. Contractor's name and address
  6. Date of original submittal
  7. Date of revised submittals

- B. Work Activities: Indicate Cost Values for labor, material, equipment, and Contractor's overhead and profit, and Total Cost Value for each line item.
1. Distribute Contractor's office overhead and profit proportionally among allocated cost for each work activity.
  2. Costs associated with ongoing mobilization activities can be listed separately or distributed evenly among allocated cost for each work activity.
  3. Assign overhead costs corresponding to start and finish dates for each work related activity.
  4. Pro-rate associated work expenses related to work activities, including supervision, temporary utilities, and small tools, over total Contract Time.
  5. Assign directly related costs, including bonds, insurance, and schedules, to appropriate work activities.
  6. Claims for additional cost for storage of materials off-site are not accepted as a basis for monetary claims, except where need for off-site storage arose after the Bid and at request of the Owner.
- C. Overhead and Administrative Costs: Distribute major cost items which are not a direct cost of actual work-in-place as line item in schedule of values, or distributed as general overhead expense.
1. Conditions of the Contract for Construction and Mobilization: Maximum 3% of Contract Sum.
  2. Demobilization: Maximum 1% of Contract Sum.
  3. Commissioning of Operational Systems: See paragraph G for required 1% of HVAC Contract to be itemized on the Schedule of Values.
  4. Closeout: Minimum of 1% of Contract Sum to cover closeout submittals and documentation and 1 percent of contract sum to cover punch list identification and completion.
  5. See Paragraph E and F for required 1% of Contract Sum for Project Record Documents completion and 1% for Operations and Maintenance Manuals completion.
- D. Stored Items: For materials not yet installed, for which Progress Payments are requested, no payment for materials stored offsite will be made without prior notice to and acceptance by Owner.
1. Submit clear title to ownership of materials in writing to Owner.
  2. Support initial value with proof of purchase invoices.
  3. Include value-added costs as separate line item when subsequently delivered to site and installed.
  4. Differentiate between items stored on-site and items stored off-site.
  5. Provide acceptable proof of insurance and bonding of storage facility and contents.

- 6. Store materials no greater distance than 50 miles from Project site.
- 7. Make storage facilities available and open to Owner and Design Professional observation.
- 8. Store materials for which payments are requested in separate areas away from other materials and clearly marked or labeled to identify name of Owner, Project, and Contractor.
- E. Project Record Documents: Include line item of at least 1% of Contract Sum for preparation, maintenance, and duplication. Upon completion, a portion of this amount will be released based upon percentage of completion of the Work as a whole.
- F. Operation and Maintenance Manuals: Include line item of at least 1% of Contract Sum for preparation, maintenance, and duplication. Upon completion, a portion of this amount will be released based upon percentage of completion of the Work as a whole.
- G. Commissioning: Include line item of at least 1% of Contract Sum for **33 31 00 SANITARY SEWER UTILITIES**, for cooperation and coordination with Commissioning Agent.
  - 1. Commissioning Agent work includes systems documentation, start up, operation, control system calibration and verification, performance testing, and as required to provide a fully working system.
  - 2. Payment for of each line item of work will be made based upon percentage completion of work and percentage of completion of commissioning work.
- H. Punch List Work: Include line item of 1% of Contract Sum or itemize separately by line item for each work activity. Payment of this 1% for each line item will be authorized as each line item of work is complete and related testing and inspections are satisfactorily completed.

#### 1.06 LINE ITEM CATEGORIES

- A. Arrange Schedule of Values in tabular form with separate columns. Break out following for each work activity listing.
  - 1. Section Number from Project Specifications Table of Contents
  - 2. Description of Work
  - 3. Name of subcontractor
  - 4. Name of manufacturer or fabricator
  - 5. Name of supplier
  - 6. Scheduled Value for each Item of Work
  - 7. Previous Work Complete, including Cost Value and Percent Complete
  - 8. Present Work Complete, including Cost Value and Percent Complete



9. Change Orders (numbers) that affect value
10. Total Billing, including Billing to Date, Percent of Contract Sum, and Balance to Finish – Show dollar value as percentage of Contract Sum to nearest one-hundredth percent, adjusted to total 100%.
11. Retainage
12. Stored Material

#### **1.07 COST CATEGORIES**

- A. Assign following, making sum equal to total cost for each line item activity to show initial costs of work activity and total installed cost.
  1. Labor
  2. Equipment
  3. Material
  4. Subcontractor
  5. Overhead and Profit
  6. Total Cost
- B. Show total sum for each cost category as well as total cost for each work activity.

#### **PART 2 PRODUCTS**

(NOT USED)

#### **PART 3 EXECUTION**

(NOT USED)

**END OF SECTION**

## **01 30 00 ADMINISTRATIVE REQUIREMENTS**

### **PART 1 GENERAL**

#### **1.01 RELATED DOCUMENTS**

- A. [01 32 00 CONSTRUCTION PROGRESS SCHEDULE AND REPORTING](#)
- B. [01 33 00 SUBMITTAL PROCEDURES](#)

#### **1.02 SUMMARY**

- A. This Section includes administrative provisions for coordinating construction operations on the Project including, but not limited to, the following:
  - 1. Construction Organization
  - 2. Coordination
  - 3. Procedures for use of administrative forms
  - 4. Preconstruction conferences
  - 5. Preinstallation conferences
  - 6. Progress meetings
  - 7. Coordination Drawings
  - 8. Project meetings

#### **1.03 CONSTRUCTION ORGANIZATION**

- A. Establish on-site lines of authority and communications including attendance at Preconstruction Meeting and Progress Meetings as required by the Owner's Representative.
  - 1. All instructions will be given to the Contractor, or to their authorized agent, by the Owner's Representative for distribution to subcontractors or trades workers on the Work; in like manner all communication from subcontractors and trades workers on the Work to the Owner's Representative will be given through the Contractor. No subcontractors or trades workers may contact the City or Owner's Representative to discuss the Work, except as the Contractor may arrange with the City.
- B. Intra-Project Communications: Comply with procedures for intra-project communications including:
  - 1. Submittals
  - 2. Reports and records
  - 3. Recommendations

4. Coordination drawings
  5. Schedules
  6. Resolution of conflicts
- C. Owner's Representative: Reference to Construction Observer, City, Contracting Officer, Landscape Design Professional, Architect, Engineer, Design Professional and City's Representative equate to the Agent for the City.
1. One individual from the City or designated by the City will serve as the Owner's Representative. All correspondence, pay requests, change orders, field directives, etc. will be directed to and/or originated from the Owner's Representative.
- D. Notice and Service Thereof
1. Any notice required or given under the Contract shall be in writing, dated, and signed by the party giving such notice or the duly authorized representative, and be served as follows:
    - a. If to the City or its assigned agents or consultants, by personal delivery or by deposit in the United States mail.
    - b. If to the Contractor, by personal delivery to the Contractor or to the authorized representative at the site of the project or by deposit in the United States mail.
    - c. If to the Surety or any other person, by personal delivery to said surety or other person or by deposit in the United States mail.
    - d. Email notice may be provided in addition and prior to delivery.
- E. Authority of the Owner's Representative and Design Professional
1. The City shall be satisfied that all the Work is being done in accordance with the requirements of the Contract. The Contract gives the City, with the assistance of the Design Professional, authority over the Work. Notices to the City shall be submitted to the Design Professional, who after any necessary investigation and analysis will recommend action which they deem appropriate and propose and prepare any necessary written decisions, determinations, interpretations and notices for review and action by the City in sufficient time to meet the requirements of the situation and of the contract. Whenever it is so provided in this Contract, the decision of the City is final. However, if an action is brought within the time allowed in this Contract challenging the City's decision, that decision will be subject to the scope of judicial review provided in such cases under Washington case law and the conditions of the Contract.
  2. The City's decision is final on all questions including, but not limited to the following:
    - a. Quality and acceptability of materials and work

- b. Measurement of unit price and lump sum work
  - c. Acceptability of rates of progress on the Work
  - d. Interpretation of plans and specifications
  - e. Determinations as to the existence of changed or differing site conditions
  - f. Fulfillment of the contract by the Contractor
  - g. Payments under the contract, including equitable adjustments
  - h. Suspension(s) of Work
  - i. Termination of the contract for default or public convenience
  - j. Determination as to non-working days, and
  - k. Approval of working drawings
3. Performance: The Design Professional will rate the Contractor's performance and contract compliance in these categories:
- a. Progress of Work
  - b. Quality of Work
  - c. Equipment
  - d. Administration/Management/Supervision
  - e. Coordination and Control of Subcontractors
- F. The Design Professional represents the City on the Project, with full authority to enforce contract requirements and carry out the City's orders. If the Contractor fails to respond promptly to the requirements of the Contract or orders from the City:
- 1. The City may use City resources, other contractors, or other means to accomplish the Work; and
  - 2. The City will not be obligated to pay the Contractor, and will deduct from the Contractor's payment any costs that result when any other means are used to carry out the contract requirements or Contracting Officer's orders.
- G. At the Contractor's risk, the City may suspend all or part of the Work if:
- 1. The Contractor fails to fulfill contract terms; or
  - 2. The Contractor fails to carry out the City's orders; or
  - 3. The weather or other conditions are unsuitable; or
  - 4. It is in the public interest.

- H. Nothing in the Contract requires the City or Design Professional to provide the Contractor with direction or advice on how to do the Work. If the Design Professional approves or recommends any method or manner for doing the Work or producing materials, the approval or recommendation does not:
  - 1. Guarantee that following the method or manner will result in compliance with the contract;
  - 2. Relieve the Contractor of any risks or obligations under the contract; or
  - 3. Create any liability to City.
- I. Permits & Approvals: Verify in writing to the Owner's Representative within thirty (30) calendar days after Notice to Proceed that subcontractors have obtained required permits and inspections for Work and for temporary facilities.
- J. Control Use of Site
  - 1. Supervise field engineering and Project layout.
  - 2. Allocate field office and storage space and work and storage areas for use of each subcontractor or Contractor.

#### **1.04 COORDINATION**

- A. The City has the right to record all events and actions related to the Work by the most convenient means necessary. Such recording may include, but is not limited to, the electronic collection of voice and images by videography and electronic or standard camera. Such recording may occur at any time and at any location where Work, including component storage, manufacture or fabrication, or meetings related to the project are occurring, on or off the site. This right shall be included in all subcontractor and supplier agreements with the Contractor.
- B. The Contractor shall coordinate Work on the Project as follows:
  - 1. Coordinate the Work of all subcontractors and make certain that, where the work of one trade is dependent upon the work of another trade, the work first installed is properly placed, installed, aligned and finished as specified or required to properly receive subsequent materials applied or attached thereto.
  - 2. Direct subcontractors to correct defects in substrates they install when subcontracts of subsequent materials have a reasonable and justifiable objection to such surfaces.
  - 3. Do not force subcontractors to apply or install products to improperly finished products.
  - 4. Schedule construction operations in the sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.

5. Coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.
6. Make provisions to accommodate items scheduled for later installation.
7. At all times that Work is underway on the Project, the Contractor's superintendent or a fully knowledgeable and qualified foreman, shall be on the site to assure proper coordination of the Work.
  - a. Before the Work begins, the Contractor shall name in writing an experienced superintendent who understands the contract and is able to supervise the Work. This superintendent must have full authority to represent and act for the Contractor. Any superintendent who repeatedly fails to follow the City's written and oral orders, directions, instructions, or determinations, is subject to removal from the Project. Upon written request of the City, the Contractor shall immediately remove such superintendent and name a replacement in writing.

C. Coordinating Utilities

1. Contractor shall be responsible for coordination of, and shall cooperate with, all utilities to be installed for service to the Project. Utilities may include, but are not limited to, natural gas, telephone, electricity, cable television, domestic water, fire protection water, storm system, and sanitary sewer system. The Contractor shall maintain communication with the utilities in order to coordinate time and requirements of the utilities' installation.
2. Contractor shall provide all Work necessary to comply with the requirements of the Contract Documents for utility work that does not meet the Contract Document requirements, or for work that is disturbed by the utility installation.

D. Where necessary, Contractor shall prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.

1. Prepare similar memoranda for the City and separate contractors where coordination of their work is required.

E. Administrative Procedures: Contractor shall coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and assure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's Construction Schedule
2. Preparation of the Schedule of Values
3. Installation and removal of temporary facilities and controls
4. Delivery and processing of submittals

5. Progress meetings
6. Preinstallation conferences
7. Project closeout activities

F. Administrative and supervisory personnel

1. Project Superintendent: Provide a full-time on-site Project Superintendent to manage the daily construction activities.
2. Project Lead: In addition to the Project Superintendent, provide a Project Lead who will be responsible for submittals review and coordination, scheduling and overseeing Pre-Installation Conferences, Progress Meetings, and other assigned quality control activities.
3. Include special personnel required for coordination of operations with other contractors.
4. Within twenty-one (21) calendar days of starting construction operations, submit a list of principal staff assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.
5. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone.

G. Procedures for Use of Administrative Forms

1. Procedures
  - a. Deliver or electronically transmit completed forms to Design Professional at the address listed in the Table of Contents of the Project Manual.
  - b. Use of forms referenced is required. Design Professional will provide electronic copies of the forms upon request. Use of Contractor's alternative forms is acceptable subject to approval of Design Professional, and provided that content of alternative forms is substantially equivalent to forms referenced in this Section.
  - c. Complete applicable information on form. Indicate date transmitted and date of required response, as applicable. Attach supporting documentation and additional descriptive information as necessary to fully describe the request.
  - d. Use a single form for each separate request. Closely related items may be included in a single request only if acceptance of one item requires acceptance of all items in the request.
2. Design Professional's Action

- a. Design Professional will review each request and return the form to Contractor with written response within seven (7) calendar days of receipt, except when it must be held for coordination with pending submittals, and Contractor is so advised.
- b. When requests are made within the time allowed for Design Professional's review, Design Professional will make reasonable effort to respond in a timely manner, but no claim for delay by Contractor will be allowed.

### 3. Forms

- a. Request for Information (RFI):
  - i. Refer to [00 63 13 REQUEST FOR INFORMATION FORM](#).
  - ii. Number consecutively. Include Design Professional's project number, if applicable; clearly specify the document reference by specification Section number, article, paragraph, Drawing number, and detail numbers as applicable. Design Professional will complete the lower portion of the form as the written response.
- b. Substitution Request Form:
  - i. Refer to [00 43 25 SUBSTITUTION REQUEST FORM \(DURING BIDDING\)](#).
  - ii. Refer to [00 63 25 SUBSTITUTION REQUEST FORM \(DURING CONSTRUCTION\)](#).
  - iii. Number consecutively. Complete all required information on the form; indicate applicable cost savings and time affect, if any. Design Professional will complete a portion of the form as the written response and will attach further written response as necessary to explain the decision, if required. Forms submitted without all required information as indicated on the form may be returned for completion before review by the Design Professional.
- c. Proposal Request:
  - i. Design Professional may submit a Proposal Request which includes detailed description of proposed modification with supplementary or revised drawings and specifications, the projected time for executing the modification, with a stipulation of any overtime work required, and the period of time during which the requested price will be considered valid.
- d. Supplemental Instructions:
  - i. Design Professional may issue a Supplemental Instruction which includes detailed description of proposed minor modification, with supplementary or revised drawings and specifications.

### 1.05 PRECONSTRUCTION CONFERENCES:



- A. The City will schedule a preconstruction conference before the start of construction, at a time convenient to the City, Contractor and the City's Representative, but no later than fourteen (14) calendar days after execution of the Contract. The conference will be held at the Project site or another convenient location. The meeting will be conducted to review responsibilities and personnel assignments.
- B. Agenda: Discuss items of significance that could affect progress, including, but not limited to, the following:
  - 1. Tentative construction schedule
  - 2. Phasing
  - 3. Critical work sequencing
  - 4. Designation of responsible personnel
  - 5. Procedures for processing field decisions and Change Orders
  - 6. Procedures for processing Applications for Payment
  - 7. Distribution of the Contract Documents
  - 8. Submittal procedures
  - 9. Preparation of Record Documents
  - 10. Use of the premises
  - 11. Responsibility for temporary facilities and controls
  - 12. Parking availability
  - 13. Office, work, and storage areas
  - 14. Equipment deliveries and priorities
  - 15. First aid
  - 16. Security
  - 17. Progress cleaning
  - 18. Working hours
  - 19. Hazardous materials abatement procedures, if any
- C. Pre-Construction Conferences: The Contractor and appropriate subcontractors must attend as required by the relevant agencies. The Contractor will contact the involved agencies within seven (7) calendar days of receiving the Notice of Intent to Award Contract or the Notice to Proceed (whichever comes first) to determine which agencies and/or departments require such conferences and will schedule all

conferences as soon as possible. The Contractor, unless otherwise specified by the Owner's Representative, will coordinate and distribute the meeting agenda to all attendees. The Owner's Representative, unless otherwise specified by contract, will take meeting minutes, recording significant discussions and agreements, and then distribute the meeting minutes to the Contractor, Design Professional, and all attendees via email within seven (7) calendar days of the meeting.

#### **1.06 PREINSTALLATION CONFERENCES**

- A. A preinstallation conference at Project site before each construction activity that requires coordination with other construction.
  - 1. The Owner's Representative, unless otherwise specified by contract, will take meeting minutes, recording significant discussions and agreements. The Owner's Representative will distribute the meeting minutes to the Contractor, Design Professional, and their team within seven (7) calendar days of the meeting, unless otherwise specified by contract. The Contractor shall distribute meeting minutes to subcontractors and other relevant parties as they deem appropriate. To the greatest extent possible, minutes will be distributed via email only. The Contractor is responsible for printing copies for their records. The Owner's Representative, unless otherwise specified by contract, will bring copies to the construction meetings.
  - 2. Attendees: Installers and/or representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Design Professional and Construction Manager, if one is retained by City, of scheduled meeting dates.
  - 3. Agenda: Contractor will coordinate the meeting agenda and distribute the agenda to each attendee. Review progress of other construction activities and preparations for the particular activity under consideration, including relevant requirements for the following:
    - a. Contract Documents
    - b. Options
    - c. Related Change Orders
    - d. Purchases
    - e. Deliveries
    - f. Submittals
    - g. Review of mockups
    - h. Possible conflicts
    - i. Compatibility problems

- j. Time schedules
  - k. Weather limitations
  - l. Manufacturer's written recommendations
  - m. Warranty requirements
  - n. Compatibility of materials
  - o. Acceptability of substrates
  - p. Temporary facilities and controls
  - q. Space and access limitations
  - r. Regulations of authorities having jurisdiction
  - s. Testing and inspecting requirements
  - t. Required performance results
  - u. Protection of construction and personnel
- 4. Contractor shall record significant conference discussions, agreements, and disagreements. Distribute to all individuals in attendance.
  - 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
  - 6. List of required Pre-Installation Conferences: The following is a list of the required pre-Installation Conferences. Also see **Divisions 02-35** for additional requirements. Others may be requested by the Owner's Representative or Contractor:
    - a. Earthwork
    - b. Sub-Drainage
    - c. Paving and Surfacing
    - d. Irrigation
    - e. Planting
    - f. Boulders
    - g. Ornamental Fencing and Gates
    - h. Cement Concrete Pavement
    - i. Cast-In-Place Concrete

- j. Cast-In-Place Design Architectural Concrete
- k. Concrete Stain
- l. Architectural Pre-Cast Concrete
- m. Structural Steel
- n. Traffic Coatings
- o. Through-Penetration Firestop systems
- p. Joint Sealants
- q. Painting/High Performance Coatings
- r. MEP and Structural Pre-Installation Coordination Meeting
- s. Fire Sprinkler System
- t. Furnishings: Art Medallions

#### **1.07 PROGRESS MEETINGS**

- A. Conduct progress meetings at the Project site on a mutually agreed upon schedule, established by the Owner's Representative and Contractor, to discuss concerns, resolve problems, review progress, and generally facilitate efficient and orderly prosecution of the Work.
- B. Attendees: Owner's Representative, Design Professional, Construction Manager (as applicable), Contractor, Subcontractor, Supplier, and other entities concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
- C. Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Coordinate scheduled meeting dates and times with City and Design Professional.
- D. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
  - 1. Schedules: Refer to [01 32 00 CONSTRUCTION PROGRESS SCHEDULE AND REPORTING.](#)
    - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

- b. Review Contractor's short-term internal schedule.
  - c. Schedule Updating: The Contractor shall revise and submit copies of the Construction Schedule at each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule concurrently with the report of each meeting.
  - d. Submittal Schedule: The Contractor shall revise and submit the submittal schedule, and discuss important and/or problem submittals and dates.
2. Review present and future needs of each entity present, including the following:
- a. Interface requirements
  - b. Abatement/Demolition Issues, as required
  - c. Sequence of operations
  - d. Status of submittals
  - e. Deliveries
  - f. Off-site fabrication
  - g. Access
  - h. Site utilization
  - i. Temporary facilities and controls
  - j. Work hours
  - k. Hazards and risks
  - l. Progress cleaning
  - m. Clarifications – RFIs & ASIs
  - n. Permitting
  - o. Quality and work standards
  - p. Cost Change Items – Change Orders, Proposal Requests and CCDs
  - q. Submittals & Shop Drawings
  - r. Overall Construction Schedule
  - s. Short-Term Interval Schedule
  - t. Documentation of information for payment requests

- E. As-Built or Record Set Documents: The Contractor shall present the status of as-built documents to verify they are being kept current. As-Built documents will be reviewed at the monthly progress payment meeting at a minimum, or as requested by the City or Design Professional. Failure to maintain current as-built documents may be grounds for withholding partial payment to the Contractor.
- F. Reporting:
  - 1. Refer to [01 32 00 CONSTRUCTION PROGRESS SCHEDULE AND REPORTING](#).
  - 2. Design Professional will record and distribute minutes of the meeting via email to the Owner, Contractor, the Testing Agency(s) (if applicable), and others the Owner's Representative deems appropriate. Contractor shall further distribute to their subcontractors and others they deem appropriate.

#### COORDINATION DRAWINGS

- A. Prepare Coordination Drawings as required to facilitate installation of products and materials fabricated by separate entities to clarify spatial relationships and efficiencies.
- B. Indicate relationship of components shown on separate Shop Drawings.
- C. Indicate required installation sequences.
- D. Refer to **Divisions 02-35** for specific coordination drawing requirements.

### **PART 2 PRODUCTS**

(NOT USED)

### **PART 3 EXECUTION**

#### **3.01 GENERAL COORDINATION PROVISIONS**

- A. General:
  - 1. At all times, the Contractor shall keep at the work site a set of the plans, specifications, Contract Documents, and addenda.
    - a. Contractor shall check specifications, addenda, and drawings covering all trades as the Work progresses. Contractor shall promptly report to the Design Professional what is considered an omission, conflict or issue requiring clarification.
  - 2. The Contractor is responsible for the coordination of the work of all trades.
    - a. Contractor shall prepare and distribute to each entity performing work at project site, a written memorandum of instructions on required coordination activities, including required notices, reports and attendance at meetings.
  - 3. The Contractor and all subcontractors, shall diligently comply with the following requirements:

- a. Devote the attention required to make reasonable progress on the work and cooperate fully with the Owner's Representative, Design Professional, assistants and inspectors.
- b. Cooperate in planning and layout of the Work well in advance of operations.
- c. Inform other contractors of requirements at proper time to prevent delay or revisions.
- d. Be informed of the requirements of other contractors and check own work for conflicts with the work of other contracts.
- e. Insure delivery of materials and performance of Work on coordinated schedule with other contracts.
- f. Keep machinery and equipment in good, workable condition. The equipment must be adequate for its purpose and used by competent operators.

**B. Coordination of Reports and Activities:**

1. Refer to [01 32 00 CONSTRUCTION PROGRESS SCHEDULE AND REPORTING](#).
2. Coordinate both the procedural timing and the listing (naming and sequencing) of reports/activities required by provisions of this Section and other sections, to afford consistency and logical coordination between submitted reports or lists. Maintain coordination and correlation between separate reports by updating at month day or shorter time intervals. Make appropriate distribution of each report and updated report to entities involved in the Work including Design Professional and Owner's Representative. In particular, provide close coordination of progress schedule, Schedule of Values, listing of subcontracts, schedule of submittals, progress reports, and payment requests.

**C. Inspection of Conditions:** Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

**D. Coordinate temporary enclosures with required inspections and tests to minimize the necessity of uncovering completed construction for that purpose.**

### **3.02 OTHER COORDINATION**

**A. General:**

1. Contractor shall give the City forty-eight (48) hours advance written notice of their intention to work overtime, nights, Sundays or holidays, or anytime outside the usual working hours. In no case shall the Contractor do any such work without first notifying the City to permit arrangements for proper inspection. See the General Conditions for specific requirements for work hours outside normal work hours.

2. Contractor shall reimburse the additional cost to the City for inspection work on Sundays, recognized holidays, or hours beyond the normal work hours as listed in [01 11 00 SUMMARY OF WORK](#). Such reimbursement shall include all additional costs to the City.
3. Contractor is cautioned that, at times during construction, there may not be sufficient room to park for all construction personnel on site. Room for trailers, materials, etc., take priority space. Other arrangements shall be made by the Contractor to satisfy their parking requirements.

**END OF SECTION**



## **01 32 00 CONSTRUCTION PROGRESS SCHEDULE AND REPORTING**

### **PART 1 GENERAL**

#### **1.01 RELATED DOCUMENTS**

- A. [01 29 00 PAYMENT PROCEDURES](#) for submitting the Schedule of Values.
- B. [01 30 00 ADMINISTRATIVE REQUIREMENTS](#) for submitting and distributing meeting and conference minutes.
- C. [01 33 00 SUBMITTAL PROCEDURES](#) for submitting schedules and reports.
- D. [01 40 00 QUALITY REQUIREMENTS](#) for submitting a schedule of tests and inspections.
- E. [01 77 00 CLOSEOUT PROCEDURES](#) for submitting photograph files as Project Record Documents at Project closeout.

#### **1.02 SUMMARY**

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
  - 1. Preliminary Construction Schedule
  - 2. Contractor's Construction Schedule
  - 3. Submittals Schedule
  - 4. Daily construction reports
  - 5. Field condition reports
  - 6. Special reports

#### **1.03 DEFINITIONS**

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
  - 1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
  - 2. Predecessor activity is an activity that must be completed before a given activity can be started.
- B. CPM: Critical Path Method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

- C. Critical Path: The longest continuous chain of activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- D. Event: The starting or ending point of an activity.
- E. Float: The measure of leeway in starting and completing an activity.
  - 1. Float time is not for the exclusive use or benefit of either City or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date, unless provided otherwise in the [00 72 13 GENERAL CONDITIONS](#).
  - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the following activity.
  - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- F. Fragment: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.
- G. Major Area: A story of construction, a separate building, or a similar significant construction element.
- H. Milestone: A key or critical point in time for reference or measurement.

#### **1.04 SUBMITTALS**

- A. Submittals Schedule: Submit a digital copy of schedule.
  - 1. Arrange the following information in a tabular format:
    - a. Scheduled date for first submittal
    - b. Specification Section number and title
    - c. Submittal category (action or informational)
    - d. Name of subcontractor
    - e. Description of the Work covered
    - f. Scheduled date for Owner's Representative's final release or approval
    - g. Submittal content
    - h. Indicate where color selections are required.
  - 2. Coordinate Submittal Schedule with the list of subcontractors, Schedule of Values, and the list of material suppliers, as well as the Contractor's Construction Schedule.
  - 3. Incorporate submittal schedule in Contractor's Construction Schedule.

- B. Preliminary Construction Schedule: Submit digital copy.
- C. Contractor's Construction Schedule: Submit a digital copy of initial and final schedule large enough to show entire schedule for entire construction period.
- D. CPM Reports: Concurrent with CPM schedule, submit a digital copy of each of the following reports. Format for each activity in reports shall contain activity number, activity description, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float.
  - 1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
  - 2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
  - 3. Total Float Report: List of all activities sorted in ascending order of total float.
  - 4. Earnings Report: Compilation of Contractor's total earnings from the Notice to Proceed until most recent Application for Payment.
- E. Daily Construction Reports: Submit a digital copy to the Design Professional and Owner's Representative at weekly intervals.
- F. Field Condition Reports: Submit at time of discovery of differing conditions via submission of an RFI (Request for Interpretation).
- G. Special Reports: Submit a digital copy at time of unusual event.

#### **1.05 QUALITY ASSURANCE**

- A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting.

#### **1.07 COORDINATION**

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontractors, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
  - 1. Secure time commitments for performing critical elements of the Work from parties involved.
  - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

### **PART 2 PRODUCTS**

#### **2.01 SUBMITTALS SCHEDULE**

- A. Refer to [01 30 00 ADMINISTRATIVE REQUIREMENTS](#) and [01 33 00 SUBMITTAL PROCEDURES](#) for additional information.
- B. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
  - 1. Coordinate Submittals Schedule with list of subcontractors, the Schedule of Values, and Contractor's Construction Schedule.
  - 2. Initial Submittal: Submit concurrently with preliminary construction schedule. Include submittals required during the first sixty (60) calendar days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
  - 3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

## **2.02 CONTRACTOR'S CONSTRUCTION SCHEDULE**

- A. General: Comply with the requirements of [00 72 13 GENERAL CONDITIONS](#) and as follows:
  - 1. Conditional Notice to Proceed will be issued after City makes its Award of the Contract, the Contract has been executed, and all required deliverables have been submitted.
  - 2. Within fourteen (14) calendar days after Contract execution, the Contractor, after consultations with its subcontractors and suppliers of any tier, shall submit a digital copy of a Contractor's Construction Schedule to the Design Professional and Owner's Representative.
    - a. The Contractor and the City will schedule a meeting to review the Construction Schedule within fourteen (14) calendar days of its submission. The meeting will address conformity with the form requirements of the Contract Documents and other comments on the schedule. Neither the City nor the Design Professional will be responsible for the substance of the Construction Schedule.
    - b. The Contractor shall consider and respond in writing to the comments and submit a revised Construction Schedule conforming with the requirements of the Contract Documents within fourteen (14) calendar days and prior to mobilizing on-site. The Contractor shall not mobilize or commence the Work at the Project site, nor shall a progress payment be due before the City provides notice that the Contractor's Construction Schedule conforms to the requirements of the Contract Documents for the form of the Schedule. If the Contractor fails to submit a Construction Schedule conforming with the requirements of the Contract Documents within sixty (60) calendar days of the Conditional Notice to Proceed, the City may terminate the

Contract without any payment to the Contractor, and withdraw its Award and Notice to Proceed.

- B. The Contractor's Construction Schedule shall be based upon a critical path method ("CPM") analysis of construction activities and sequence of operations needed for the orderly performance and completion of all separable parts of the Work in accordance with the Contract and within the Contract Time. The schedule shall be a critical path method type in the form of a precedence diagram and activity listing, and shall be time-scaled. It shall include the Notice to Proceed date, date for mobilization on site, Occupancy Date, the Date(s) of Substantial Completion, and the Date(s) of Final Completion in accordance with the Contract Documents. A single Critical Path shall be clearly indicated on the Contractor's Construction Schedule.
1. A schedule for the purchase and receipt of items required for performance of the Work, showing lead times between purchase order placement and delivery dates, shall be integrated with the Contractor's Construction Schedule. The Contractor shall furnish the Owner's Representative with copies of all purchase orders and acknowledgments and fabrication, production, and shipping schedules for all major items on the critical path within fourteen (14) calendar days of Contractor's receipt of each purchase order, acknowledgment or schedule. Neither the Owner's Representative nor the City shall be responsible for any such material, or its schedule, nor deemed to have waived this requirement if some or all of the material is not received.
  2. Milestone completion dates, including all such dates specified in the Contract Documents, shall be clearly defined on the Contractor's Construction Schedule and shall include the actual start date on site.
  3. If abbreviations are used in the Contractor's Construction Schedule, a legend shall be provided to define all abbreviations.
  4. The Contractor shall prepare and keep current a schedule of submittals, coordinated with the Contractor's Construction Schedule, which allows the Design Professional at least fourteen (14) calendar days to review the submittals.
  5. Progress Schedules shall be submitted digitally.
  6. At each weekly meeting with the City, the Contractor shall submit (a) a bar chart schedule showing the activities planned for the next month, (b) a report showing actual starts and finishes from the previous month, and (c) the Contractor's Construction Schedule for the remainder of the Work. The bar-chart schedule shall show all work activities numbered according to the CPM, any submittal or delivery activities with less than seven (7) calendar days' float, and any permitting, testing, or inspection activities by others.
- C. Review of and commenting on the Contractor's Construction Schedule by the City and Design Professional shall not constitute an approval or acceptance of, or create City responsibility for, the

Contractor's construction means, methods, or sequencing, or its ability to complete the Work in a timely manner.

- D. The Contractor shall utilize and comply with the Contractor's Construction Schedule. The Contractor shall not be entitled to any adjustment in the Contract Time, the Contractor's Construction Schedule, or the Contract Sum, or to any additional payment of any sort by reason of the loss or use of any float time, including time between the Contractor's anticipated completion date and end of the Contract Time, whether or not the float time is described as such on the Contractor's Construction Schedule.
- E. Should the Contractor fail to meet any scheduled date as shown on the current Contractor's Construction Schedule, the Contractor shall, if requested, be required at its own expense to submit within fourteen (14) calendar days of the request an updated Contractor's Construction Schedule. If the Contractor's progress indicates to the City or Design Professional that the Work will not be Substantially Completed within the Contract Time, the Contractor shall, at its own expense, increase its work force and/or working hours to bring the actual completion dates of the activities into conformance with the Contractor's Construction Schedule and Substantial Completion within the Contract Time. The Contractor shall also submit a revised Contractor's Construction Schedule at its own expense within fourteen (14) calendar days of notice from the Design Professional that the sequence of work varies significantly from that shown on the Contractor's Construction Schedule. Neither the City nor the Design Professional will, however, be responsible for the substance or sequence of the Contractor's Construction Schedule.
- F. Schedule Float Utilization: Any float time to activities not on the critical path shall belong to the Project, which means neither the Contractor nor the City have exclusive right to this Float Time. It may be utilized by the Contractor to optimize its construction process and shall also be available to accommodate changes in the Work and unforeseen conditions. Float time specifically includes any time between the end of the final construction activity and the Final Completion date. The Contractor will not be entitled to any adjustment in the Contract Time, the Construction Schedule, or the Contract Sum, or to any additional payment of any sort by reason of the loss or use of any float time, including time between the Contractor's anticipated completion date and end of the Contract Time, whether or not the float time is described as such on the Construction Schedule.
- G. Delays: The Contractor, within the times required in Section [00 72 13 GENERAL CONDITIONS](#) – Claims Process, shall, notify the City and Design Professional in writing of any proposed changes in the Contractor's Construction Schedule or the Contract Time and of any event which could delay performance or supplying of any item of the Work and shall indicate the expected duration of the delay, the anticipated effect of the delay on the Contractor's Construction Schedule, and the action being taken to correct the delay situation. In the event the Contractor is entitled to a change in the Contract Time, the adjustment to the Contract Time shall be limited to the change in the critical path of construction activities.

- H. Final Completion: The Contractor shall attain Final Completion of the Work in accordance with the Contract within thirty (30) calendar days after the date of Substantial Completion, unless indicated otherwise in the Contract Documents.
- I. Meetings: During the period commencing with the issuance of Notice to Proceed and ending with the date of Final Completion of the Work, the Contractor shall attend and participate in and ensure applicable Subcontractors of any tier and suppliers attend and participate in meetings, including:
  - 1. Pre-contract meeting
  - 2. Construction schedule meeting
  - 3. Preconstruction meetings
  - 4. Regular weekly on-site meetings scheduled by the Owner's Representative or Design Professional to review progress of the Work, to discuss the Contractor's progress reports, to obtain necessary Owner's Representative or Design Professional approvals, and generally to keep them informed and involved in the progress of the Project

## **2.03 REPORTS**

- A. Report Form: Use [00 62 86 WEEKLY STATEMENT OF WORKING DAYS FORM](#) to record working days. This form shall be signed by the contractor and submitted every Monday following the week reported for duration of project.
- B. Weekly Construction Reports: Prepare a weekly construction report recording the following information concerning events at the site. Submit duplicate copies to the City and the City's Representative at weekly intervals:
  - 1. List of subcontractors at the Project site
  - 2. Approximate count of personnel at Project site
  - 3. Actual work accomplished broken down by trade
  - 4. General weather conditions
  - 5. Accidents
  - 6. Materials delivery
  - 7. Meetings and significant decisions
  - 8. Unusual events (refer to special reports)
  - 9. Stoppages, delays, shortages, and losses
  - 10. Inspections and tests performed and their results, if known

11. Orders and requests of governing authorities

12. Services connected, disconnected

- C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare a detailed report. Submit with a Request For Interpretation on Design Professional's RFI form. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.
- D. Materials Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.

## **2.04 SPECIAL REPORTS**

- A. General: Submit special reports directly to City within one (1) working day of an occurrence. Distribute copies of report to parties affected by the occurrence.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise City in advance when these events are known or predictable.

## **PART 3 EXECUTION**

### **3.01 CONTRACTOR'S CONSTRUCTION SCHEDULE**

- A. Schedule: Submit digital copies of a schedule (PDF or similar) within fifteen (15) calendar days of the Notice to Proceed to the City's Representative. For ease of analysis, computer color coded and color printed schedules are preferred.
- B. Provide a separate time bar for each significant construction activity. At a minimum, show all of the items identified in the Schedule of Values and further subdivide as necessary to properly track all significant work activity.
- C. Provide a continuous vertical line to identify the first working day of each week.
- D. Prepare the schedule on a sheet, or series of sheets, of sufficient width to show data for the entire construction period. Minimum size shall be necessary to produce an easily legible document.
- E. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on schedule with other construction activities. Include minor elements involved in the overall sequence of the Work. Show each activity in proper sequence. Indicate graphically the sequences necessary for completion of related portions of the Work.



- F. Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the schedule to allow time for the City's administrative procedures necessary for certification of Substantial Completion.
- G. No Application for Payment will be reviewed, nor payment made, beyond the initial mobilization payment, if the complete Schedule has not been submitted and approved or is not up to date. The complete schedule must be reviewed and approved in writing by the City and their representative before becoming part of the Contract. The approved schedule will be a tool for the City and its representative to evaluate project progress, allocate funds and assess the reasonableness of Application for Payment amounts and City's disbursements related thereto.
- H. Work Stages: Use crosshatched bars or other acceptable highlighting to indicate important stages of construction for each major portion of the Work.
- I. Distribution:
  - 1. Refer to [01 30 00 ADMINISTRATIVE REQUIREMENTS](#).
  - 2. Following response to the initial submittal, print and distribute a digital copy to the City's Representative. Provide copies to subcontractors and other parties required to comply with scheduled dates. Post copies in the Project meeting room and temporary field office. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.
- J. Schedule Updating:
  - 1. Refer to [01 30 00 ADMINISTRATIVE REQUIREMENTS](#).
  - 2. Revise the schedule after each meeting, event, or activity where revisions have been recognized or made and where mutually agreed upon by the City and their representative. Issue the updated schedule within seven (7) calendar days of the agreement for the revisions.
  - 3. If the overall schedule falls more than seven (7) calendar days behind schedule the Contractor shall immediately prepare a written explanation of the delay and proposed course of action, including specifics of workforce manpower, scheduling, use of premium time, etc. to bring the project back onto the original schedule or a new schedule that reaches the same date of Substantial Completion.
  - 4. Revised schedules shall show actual start/stop/completion dates overlaid with original planned dates.

**END OF SECTION**



**01 33 00 SUBMITTAL PROCEDURES****PART 1 GENERAL****1.01 RELATED DOCUMENTS**

- A. [00 43 25 SUBSTITUTION REQUEST FORM \(DURING BIDDING\)](#)
- B. [00 60 06 SUBMITTAL FORM](#)
- C. [00 63 25 SUBSTITUTION REQUEST FORM \(DURING CONSTRUCTION\)](#)
- D. [01 30 00 ADMINISTRATIVE REQUIREMENTS](#) for submitting Coordination Drawings.
- E. [01 32 00 CONSTRUCTION PROGRESS SCHEDULE AND REPORTING](#) for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
- F. [01 40 00 QUALITY REQUIREMENTS](#) for submitting test and inspection reports and Delegated-Design Submittals and for erecting mockups.
- G. [01 77 00 CLOSEOUT PROCEDURES](#) for additional closeout submittal requirements.
- H. [01 78 23 OPERATIONS AND MAINTENANCE DATA](#) for operation and maintenance manual requirements.
- I. [01 78 39 PROJECT RECORD DOCUMENTS \(AS BUILTS AND RECORD SET\)](#) for submitting Record Drawings, Record Specifications, and Record Product Data.

**1.02 SUMMARY**

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.

**1.03 DEFINITIONS**

- A. Action Submittals: Written and graphic information that requires Design Professional's responsive action.
- B. Informational Submittals: Written information that does not require Design Professional's approval. Submittals may be rejected for not complying with requirements.
- C. Coordination Drawings show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or to function as intended.
- D. Preparation of Coordination Drawings is specified in [01 30 00 ADMINISTRATIVE REQUIREMENTS](#) and may include components previously shown in detail on Shop Drawings or Product Data.
- E. Field samples are full-size physical examples erected on-site to illustrate finishes, coatings, or finish materials. Field samples are used to establish the standard by which the Work will be judged.

- F. Mockups are full-size assemblies for review of construction, coordination, testing, or operation; they are not Samples.
- G. Shop Drawings: Shop drawings include specially-prepared technical data for this project, including drawings, diagrams, performance curves, data sheets, schedules, templates, patterns, reports, calculations, instructions, measurements and similar information not in standard printed form for general application to several projects.

#### 1.04 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
  - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  - 2. Shop, catalog, and other appropriate drawings and information shall be submitted to the Owner's Representative for review prior to fabrication or ordering of all equipment and materials specified.
  - 3. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Owner's Representative reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
    - b. Colors: Owner's Representative will not process color related submittals until all color related submittals are received, reviewed, color selections have been made and approved by the City, and the Color Schedule in the drawings has been amended to reflect final choices made. It is imperative that the Contractor get all color related submittals to the Owner's Representative as quickly as possible to facilitate the color selection process. The process cannot begin without all color related submittals. Delays or reduction in color choices due to this process or the Contractor's failure to provide submittals in a timely fashion will not be accepted.
- B. Submittals Schedule: Comply with requirements in [01 32 00 CONSTRUCTION PROGRESS SCHEDULE AND REPORTING](#) for list of submittals and time requirements for scheduled performance of related construction activities. The Submittal Schedule shall document the Contractor's planning for the timely execution of the Work, in accordance with the Construction Contract and submittal requirements set forth in this Section.
- C. Processing Time: Allow enough time for submittal review, including time for re-submittals, as follows. Time for review shall commence on Owner's Representative's receipt of submittal during a normal work day (excluding holidays).

1. Initial Review: Allow fourteen (14) calendar days for initial review of each submittal. Allow additional time if processing must be delayed due to permit coordination with subsequent submittals. Design Professional will advise Contractor when a submittal being processed must be delayed for coordination.
  2. Concurrent Review: Where concurrent review of submittals by Design Professionals, City, or other parties is required, allow twenty-one (21) calendar days for initial review of each submittal.
  3. Interrelated Submittals: Where one submittal cannot be fully reviewed without receipt of another submittal, the time frame for review will not begin until interrelated submittals are received.
  4. If intermediate submittal is necessary, process it in same manner as initial submittal.
  5. Allow same time frames as above for processing each resubmittal.
  6. If a submittal is in any way incomplete or inadequate, and the Design Professional requests additional information, requires a re-submittal, or rejects the submittal, the above stated time frames for review will start over once the complete and adequate submittal is received.
  7. No extension of Contract Time will be authorized due to delays caused by the Contractor's failure to transmit submittals to the Owner's Representative sufficiently in advance of the Work to permit timely processing. Deficiencies in the submittals and any delays related thereto are solely the responsibility of the Contractor.
  8. Multiple Submittals from Contractor: Where the Contractor submits multiple submittals at the same time; they shall prioritize the return of the submittals, and allow additional time for review as is reasonable depending on the number of submittals already in process and in the new batch of submittals.
  9. The City and Owner's Representative make no guarantee for turnaround time when submittals involve the input, review, or other action by the authority having jurisdiction or other entities and agencies over which the City has no control or authority.
- D. Identification: Place a permanent label or title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
  2. Provide an adequate amount of space on label or beside title block to record Contractor's review and approval markings and action taken by Design Professional.
  3. Include the following information on label for processing and recording action taken:
    - a. Project name
    - b. Date
    - c. Name and address of Design Professional

- d. Name and address of Contractor
  - e. Name and address of subcontractor
  - f. Name and address of supplier
  - g. Name of manufacturer
  - h. Unique identifier, including revision number
  - i. Number and title of appropriate Specification Section
  - j. Drawing number and detail references, as appropriate
  - k. Other necessary identification
- E. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.
- F. Additional Copies: Provide additional copies with physical sample submittals:
- 1. Submit one (1) additional copy of submittal for concurrent review by the Owner in addition to specified number of copies for the Design Professional and their Consultants.
  - 2. Additional copies submitted for maintenance manuals will be marked with action taken and will be returned.
- G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using the provided transmittal form. Design Professional will return submittals, without review, received from sources other than Contractor.
- 1. Placement of Orders for Materials & Components: Do not place orders for materials or components before receipt of reviewed and accepted submittal from Owner's Representative.
  - 2. On provided Submittal Form, record relevant information, requests for data, revisions other than those requested by Design Professional on previous submittals, and deviations from requirements of the Contract Documents, including minor variations and limitations. Include the same label information as the related submittal.
  - 3. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- 1. Do not proceed with fabrication or installation until a copy of submittal is in appropriate party's possession.

2. Do not permit use of submittals prior to final approval.
- I. Use for Construction: Use only final submittals with mark indicating action taken by Design Professional in connection with construction.

## **PART 2 PRODUCTS**

### **2.01 ACTION SUBMITTALS**

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
  1. Number of Copies: Submit the number of copies of each submittal required by the Design Professional as indicated in each specification section; those required by the Contractor for their use, and for the Project Record Documents; plus three (3) copies of physical samples or one (1) digital copy to be retained by the Design Professional, their Consultants and the City. Design Professional will return copies.
    - a. Mark up and retain one (1) returned copy as a Project Record Document, a copy for the Contractor's office, a copy for the job site which the City and Design Professional shall have access to, and other copies as needed for subcontractors and suppliers. Transmit one additional copy of submittals directly to the City for their use in concurrent review at the time of submission to the Design Professional. This set is in addition to the final set the Design Professional will transmit to the City following their review.
  2. Color Submittals and Samples: Submit in quantities as listed above for shop drawing and product data portions of color submittals. For color samples, provide three full sets which will be retained by the Design Professional and used in preparation or modification of color boards. Samples must be of actual materials, not printed color facsimiles.
  3. Resubmittal: Submit in same quantities as the original submittal.
  4. Do not use Shop Drawings or Product Data Submittals without an appropriate final stamp indicating action taken.
- B. Product Data
  1. Collect information into a single submittal for each element of construction and type of product or equipment.
  2. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
  3. Mark each copy of each submittal to show which products and options are applicable.
  4. Include the following information, as applicable:
    - a. Manufacturer's written recommendations

- b. Manufacturer's product specifications
  - c. Manufacturer's installation instructions
  - d. Standard color charts
  - e. Manufacturer's catalog cuts
  - f. Wiring diagrams showing factory-installed wiring
  - g. Printed performance curves
  - h. Operational range diagrams
  - i. Mill reports
  - j. Standard product operating and maintenance manuals
  - k. Compliance with recognized trade association standards
  - l. Compliance with recognized testing agency standards
  - m. Application of testing agency labels and seals
  - n. Notation of coordination requirements
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Include the following information, as applicable:
- a. Dimensions
  - b. Identification of products
  - c. Fabrication and installation drawings
  - d. Roughing-in and setting diagrams
  - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring
  - f. Shop work manufacturing instructions
  - g. Templates and patterns
  - h. Schedules
  - i. Design calculations
  - j. Compliance with specified standards
  - k. Notation of coordination requirements
  - l. Notation of dimensions established by field measurement



2. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
  3. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 30 by 42 inches.
  4. Number of Copies: Same number as noted above for Action Submittals.
  5. Highlight, encircle, or otherwise indicate deviations from the Contract Documents on the Shop Drawings.
  6. Shop Drawing copies must contain an appropriate final stamp or other marking indicating the action taken by the Owner's Representative to be used in construction.
- D. Coordination Drawings: Comply with requirements in [01 32 00 CONSTRUCTION PROGRESS SCHEDULE AND REPORTING](#). Provide in same quantity as listed for Action Submittals.
- E. Samples: Prepare physical units of materials or products, including the following:
1. Comply with requirements in [01 40 00 QUALITY REQUIREMENTS](#) for mockups.
  2. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
  3. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture variations expected.
  4. Samples include, but are not limited to, the following:
    - a. Partial sections of manufactured or fabricated components
    - b. Small cuts or containers of materials
    - c. Complete units of repetitively used materials
    - d. Swatches showing color, texture, and pattern
    - e. Color range sets
    - f. Components used for independent inspection and testing
  5. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Prepare Samples indicated to match Design Professional's sample when required to match. Attach label on unexposed side that includes the following:
    - a. Generic description of sample
    - b. Product name or name of manufacturer

- c. Sample source
- 6. Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, provide the following:
  - a. Size limitations
  - b. Compliance with recognized standards
  - c. Availability
  - d. Delivery time
- 7. Submit Samples for review of kind, color, pattern, and texture for a final check of these characteristics with other elements and for a comparison of these characteristics between final submittal and actual component as delivered and installed.
  - a. If variation in color, pattern, texture, or other characteristic is inherent in the product represented by a Sample, submit at least three sets of paired units that show approximate limits of the variations.
  - b. Refer to individual Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.
- 8. Number of Samples for Initial Selection: Submit three full sets of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Design Professional will return submittal with options selected. Samples will not be returned.
- 9. Number of Samples for Verification: Submit at least three sets of Samples, plus the number the Contractor needs for their subcontractor's or supplier's use. Design Professional will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a Project Record Sample.
  - a. Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
- 10. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
  - a. Samples will generally not be returned to the Contractor, except under special circumstances where the Contractor makes arrangements with the Design Professional to provide samples that will be incorporated into the Work. Samples returned but not incorporated into the Work, or otherwise designated as City's property, are the property of Contractor. Samples that are incorporated into the Work must be undamaged.

- F. Quality Control Submittals: Include, but are not limited to, the following:
  - 1. Design data
  - 2. Certifications
  - 3. Manufacturer's instructions
  - 4. Manufacturer's field reports
- G. Product Schedule or List: Prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
  - 1. Type of product – Include unique identifier for each product.
  - 2. Number and name of room or space
  - 3. Location within room or space
- H. Delegated-Design Submittal: Comply with requirements in [01 40 00 QUALITY REQUIREMENTS](#).
- I. Submittals Schedule: Comply with requirements in [01 32 00 CONSTRUCTION PROGRESS SCHEDULE AND REPORTING](#).

## 2.02 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
  - 1. Number of Copies: Submit one (1) digital copy of each informational submittal, unless otherwise indicated. Design Professional will not return copies.
  - 2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
  - 3. Test and Inspection Reports: Comply with requirements in [01 40 00 QUALITY REQUIREMENTS](#).
- B. Contractor's Construction Schedule: Comply with requirements in [01 32 00 CONSTRUCTION PROGRESS SCHEDULE AND REPORTING](#) and the [00 72 13 GENERAL CONDITIONS](#).
- C. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of Design Professionals and Owner, and other information specified.
- D. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements.

- E. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.
- F. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.
- G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.
- H. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements.
- I. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.
- J. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements.
- K. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- L. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements.
- M. Product Test Reports: Prepare written reports indicating the current product produced by manufacturer complies with requirements. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- N. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
  - 1. Name of evaluation organization
  - 2. Date of evaluation
  - 3. Time period when report is in effect
  - 4. Product and manufacturers' names

5. Description of product
  6. Test procedures and results
  7. Limitations of use
- O. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements in [01 78 23 OPERATIONS AND MAINTENANCE DATA](#).
- P. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.
- Q. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:
1. Preparation of substrates
  2. Required substrate tolerances
  3. Sequence of installation or erection
  4. Required installation tolerances
  5. Required adjustments
  6. Recommendations for cleaning and protection
- R. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:
1. Name, address, and telephone number of factory-authorized service representative making report
  2. Statement on condition of substrates and their acceptability for installation of product
  3. Statement that products at Project site comply with requirements
  4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken
  5. Results of operational and other tests and a statement of whether observed performance complies with requirements
  6. Statement whether conditions, products, and installation will affect warranty

7. Other required items indicated in individual Specification Sections
- S. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

### **PART 3 EXECUTION**

#### **3.01 CONTRACTOR'S REVIEW**

- A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Design Professional.
- B. Do not submit incomplete, inaccurate, or non-complying submittals.
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

#### **3.02 DESIGN PROFESSIONAL'S ACTION**

- A. General: Design Professional will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Design Professional will review each submittal, make marks to indicate corrections or modifications required, and return it. Design Professional will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as indicated in this article.
- C. Action Stamp - Design Professional's Response: The Design Professional will stamp each submittal with a uniform, action stamp, or cover sheet with action stamp. The Design Professional will mark the stamp appropriately to indicate the action taken, as follows:
  1. "No Exceptions Taken": If this box is marked, the work covered by the submittal may proceed provided it complies with the requirements of the Contract Documents; acceptance of the work will depend upon compliance with requirements.
  2. "Note Markings/Comments": If this box is marked, the work covered by the submittal may proceed provided it complies with both the Design Professional's/Engineer's notations or corrections to the submittal and with the requirements of the Contract Documents; acceptance of the work will depend on compliance with requirements.
  3. "Revise and Resubmit": If this box is marked, do not proceed with the work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise the submittal in accordance with the Design Professional's/Engineer's notations and resubmit without delay. Repeat if necessary.

4. "Rejected": If this box is marked, do not proceed with the work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise the submittal or prepare a new submittal in accordance with the Design Professional's/Engineer's notations and resubmit without delay.
- D. Informational Submittals: Design Professional will review each submittal and will not return it, or will reject and return it if it does not comply with requirements. Design Professional will forward each submittal to appropriate party.
- E. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

### **3.03 OWNER'S REPRESENTATIVE'S ACTION**

- A. Except for submittals for the record or for information, where action and return of submittals is required, the Owner's Representative will review each submittal, mark to indicate the action taken, and return. Compliance with specified characteristics is the Contractor's responsibility and not considered part of the Owner's Representative's review and indication of action taken.
- B. Action Stamp: The Owner's Representative will stamp each submittal with a uniform action stamp. The Owner's Representative will mark the stamp appropriately to indicate the action taken, as follows:
  1. Final Unrestricted Release: Where submittals are marked "No Exception Taken," the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents. Final acceptance will depend on that compliance. "No Exception Taken" does not approve any variance from the Contract Document unless expressly stated.
  2. "Comments" or "Note Markings on Drawing/Resubmission Not Required": the Work covered by the submittal may proceed provided it complies with both the Owner's Representative's notations and corrections on the submittal and requirements of the Contract Documents. Final acceptance will depend on that compliance.
  3. Returned for Resubmittal: When submittal is marked "Revise and Resubmit," do not proceed with the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal according to the Owner's Representative's notations. Resubmit without delay. Repeat if necessary to obtain a different action mark. Do not permit submittals marked "Revise and Resubmit" to be used at the Project site or elsewhere where construction is in progress.
  4. Rejected: When submittal is marked "Rejected," do not proceed with the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Do not revise this submittal as it is substantively unacceptable for the intended purpose or is otherwise out of conformance with Contract Documents. Prepare a new submittal according to the Owner's Representative's notations and in conformance with the Contract Documents. Provide an appropriate and correct

submittal without delay. Do not permit submittals marked "Rejected" to be used at the Project site or elsewhere where construction is in progress.

5. Other Action: Where a submittal is primarily for information or record purposes or for special processing or other contractor activity, the submittal will be returned, marked "Action Not Required."

### **3.04 SUBMITTALS LIST**

#### **A. General**

1. The listing of submittals hereinafter is set forth generally as a check list for the Contractor's convenience and are general in nature.
2. The Contractor shall add to this list any omissions of any submittals specified in other Sections but not listed hereinafter.
3. Contractor shall prepare a full listing of all submittals, including those required in **Divisions 02 - 35** in accordance with this Section.
4. Also refer to the General Conditions of the Contract for Construction for additional submittal requirements. In the case of any discrepancies between this section and the General Conditions, the requirements of the General Conditions shall govern.

#### **B. Submittals, within seven (7) calendar days of Notice of Intent to Award Contract:**

1. Executed Agreement
2. Performance and Labor & Material Payment Bonds (State of Washington Statutory Form for Public Work, RCW 39.08) with certified copy of Power of Attorney from Attorney-in-Fact executing bonds
3. A designation of the Work to be performed by the Contractor by their own forces
4. List of subcontractors and major material suppliers for principal portions of the Work
5. List of proprietary names and suppliers of principal items or systems of materials and equipment proposed for the Work

#### **C. Submittals, within fourteen (14) calendar days following Contract execution:**

1. Schedule of Values
2. Construction schedule in prescribed form, as defined in [01 32 00 CONSTRUCTION PROGRESS SCHEDULE AND REPORTING](#)
3. Submittal Schedule
4. Chain of Command organization chart, as defined in the General Conditions



5. Emergency telephone list for key personnel of Contractor and principal subcontractors
  6. A designation of the Work to be performed by the Contractor by their own forces
  7. List of subcontractors and major material suppliers for principal portions of the Work
  8. Washington State Patrol Background Check: Proof that all individuals that provide labor or are on site for this project have been checked by the Washington State Patrol and have no criminal history related to offenses involving minors
  9. List of proprietary names and suppliers of principal items or systems of materials and equipment proposed for the Work
  10. Emergency telephone list for key personnel of Contractor and principal subcontractors
  11. Refer to [00 72 13 GENERAL CONDITIONS](#) for additional requirements.
- D. Submittals, within thirty (30) calendar days after Notice to Proceed:
1. Refer to [00 72 13 GENERAL CONDITIONS](#) for additional requirements.
- E. Submittals, at least fourteen (14) calendar days prior to the First Month's Application for Payment:
1. [00 61 23 RETAINAGE ELECTION FORM](#)
  2. Waste Management Plan
- F. Submittals, to precede or accompany the First Month's Application for Payment
1. Statement of Intent to Pay Prevailing Wages on Public Works Contract:
    - a. One form issued by the State of Washington, Department Labor & Industries.
    - b. One is required from the Contractor and one from each of those subcontractors who will provide labor on the project site.
    - c. When these forms have been filled in, the Contractor shall send them to the Industrial Statistician in Olympia for certification. After certification, copies will be returned to the Contractor. They shall forward the City's copy directly to the City (do not send through the Design Professional). The Contractor shall send the Design Professional a copy of their transmittal letter to the City.
      - i. For further information, contact the State of Washington Industrial Statistician.
    - d. Copies of building permits
  2. Submittals, Prior to Each Month's Payment:
    - a. Application and Certification: Refer to [01 29 00 PAYMENT PROCEDURES](#).
    - b. Certified Payroll

- c. Notarized affidavit of payments to all subcontractors and major material suppliers: Refer to [01 29 00 PAYMENT PROCEDURES](#).
  - d. Signed receipts from principal subcontractors and major material suppliers: Refer to [01 29 00 PAYMENT PROCEDURES](#).
  - e. Updated CPM construction schedule
  - f. WSSP monthly documentation
3. Submittals, within forty-five (45) calendar days After Notice to Proceed:
- a. All color samples required for the entire project for all materials and products requiring color selection, or sooner if required by the project schedule.
4. Submittals, during the Project Construction Period:
- a. All shop drawings, samples (other than color samples) and brochures specified in each Section of the Project Manual to be submitted within thirty (30) calendar days after Notice to Proceed, or sooner if required by the project schedule.
- G. Submittals, prior to Substantial Completion:
- 1. Notification to Design Professional that work of the Project is substantially complete, including a listing of items of Work to be completed or corrected, together with a Certificate of Occupancy or occupancy permit issued by the Local Building Department for the entire Project.
  - 2. Refer also to other Sections for additional submittal items required as a prerequisite to Substantial Completion.

**END OF SECTION**

## **01 40 00 QUALITY REQUIREMENTS**

### **PART 1 GENERAL**

#### **1.01 RELATED DOCUMENTS**

- A. [01 32 00 CONSTRUCTION PROGRESS SCHEDULE AND REPORTING](#) for developing a schedule of required tests and inspections.
- B. [01 73 29 CUTTING AND PATCHING](#) for repair and restoration of construction disturbed by testing and inspecting activities.
- C. **Divisions 02 - 35** for specific test and inspection requirements.

#### **1.02 SUMMARY**

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Quality-control services include inspections, tests, and related actions, including reports performed by Contractor, by independent agencies, and by governing authorities. They do not include contract enforcement activities performed by Owner's Representative.
  - 1. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
  - 2. Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
  - 3. Specified tests, inspections, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with the Contract Document requirements.
  - 4. Requirements for Contractor to provide quality-control services required by Design Professional, City, or authorities having jurisdiction are not limited by provisions of this Section.

#### **1.03 DEFINITIONS**

- A. Delegated Design of Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
- B. Mockups: Full-size, physical example assemblies to illustrate finishes and materials. Mockups are used to verify selections made under Sample submittals, to demonstrate aesthetic effects and, where

indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Mockups establish the standard by which the Work will be judged.

- C. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.
- D. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Design Professional.
- E. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

#### **1.04 SUBMITTALS**

- A. If the Contractor is responsible for the service, submit a certified written report of each inspection, test, or similar service through the Contractor. Contractor to retain copies of all inspection reports on site and make available to the governing, jurisdictional, or recognizable authority.
  - 1. Submit additional copies of each written report directly to the governing authority, when the authority so directs.
- B. If the Contractor is not responsible for the service, the independent testing agency shall submit a certified written report of each inspection, test, or similar service to the Owner's Representative with copies to the City and Contractor.
- C. Qualification Data: For testing agencies specified in "Quality Assurance" in each individual specification section to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- D. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement, signed and sealed by the responsible Design Professional, for each product and system specifically assigned to Contractor to be designed or certified by a Design Professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.
  - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Design Professional.
- E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
  - 1. Specification Section number and title
  - 2. Description of test and inspection

3. Identification of applicable standards
  4. Identification of test and inspection methods
  5. Number of tests and inspections required
  6. Time schedule or time span for tests and inspections
  7. Entity responsible for performing tests and inspections
  8. Requirements for obtaining samples
  9. Unique characteristics of each quality-control service
- F. Reports: Prepare and submit certified written reports that include the following:
1. Date of issue
  2. Project title and number
  3. Name, address, and telephone number of testing agency
  4. Dates and locations and time schedule or time span of samples and tests or inspections
  5. Names of individuals making tests and inspections
  6. Description of the Work and test and inspection method
  7. Identification of product and Specification Section
  8. Complete test or inspection data
  9. Test and inspection results and an interpretation of test results
  10. Ambient conditions at time of sample taking and testing and inspecting
  11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements
  12. Name and signature of laboratory inspector
  13. Recommendations on retesting and reinspecting
- G. Permits, Licenses, and Certificates: For City's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

#### **1.05 QUALITY ASSURANCE**

- A. Qualifications for Service Agencies: Engage inspection and testing service agencies, including independent testing laboratories, that are pre-qualified as complying with the American Council of

Independent Laboratories' "Recommended Requirements for Independent Laboratory Qualification" and that specialize in the types of inspections and tests to be performed.

1. An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E 548, and that specializes in types of tests and inspections to be performed.
  2. Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the jurisdiction where the Project is located.
- B. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance.
- F. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product, which are similar to those indicated for this Project in material, design, and extent.
- G. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
1. Requirement for specialists shall not supersede building codes and similar regulations governing the Work, nor interfere with local trade-union jurisdictional settlements and similar conventions.
- H. Preconstruction Testing: Testing Agency shall perform preconstruction testing for compliance with specified requirements for performance and test methods.
1. Contractor responsibilities include the following:
    - a. Provide test specimens and assemblies representative of proposed materials and construction. Provide sizes and configurations of assemblies to adequately demonstrate capability of product to comply with performance requirements.

- b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
  - c. Fabricate and install test assemblies using installers who will perform the same tasks for Project.
  - d. When testing is complete, remove assemblies; do not reuse materials on Project.
- 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Design Professional, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- I. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
  - 1. Build mockups in location and of size indicated or, if not indicated, as directed by Design Professional.
  - 2. Notify Design Professional seven (7) calendar days in advance of dates and times when mockups will be constructed.
  - 3. Demonstrate the proposed range of aesthetic effects and workmanship.
  - 4. Obtain Design Professional's approval of mockups before starting work, fabrication, or construction.
  - 5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
  - 6. Demolish and remove mockups when directed, unless otherwise indicated.

## 1.06 QUALITY CONTROL

- A. City Responsibilities, General: Where quality-control services are indicated as City's responsibility, City will engage a qualified testing agency to perform these services:
  - 1. City will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of the types of testing and inspecting they are engaged to perform.
  - 2. Payment for these services will be made by the City.
  - 3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

4. Where individual Sections specifically indicate that certain inspections, tests, and other quality-control services are the City's responsibility, the City will employ and pay a qualified independent testing agency to perform those services.
  - a. Where the City has engaged a testing agency for testing and inspecting part of the Work, and the Contractor is also required to engage an entity for the same or related element, the Contractor shall not employ the entity engaged by the City, unless agreed to in writing by the City.
- B. Contractor Responsibilities, General: Unless otherwise indicated as the responsibility of another identified entity, Contractor shall provide inspections, tests, and other quality-control services specified elsewhere in the Contract Documents and required by authorities having jurisdiction.
  1. Coordination: Coordinate the sequence of activities to accommodate required services with a minimum of delay. Coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspection fees.
  2. Where individual Sections specifically indicate that certain inspections, tests, and other quality-control services are the Contractor's responsibility, the Contractor shall employ and pay a qualified independent testing agency to perform quality-control services. Costs for these services are included in the Contract Sum.
    - a. Contractor shall not employ the same entity engaged by City, unless agreed to in writing by City.
  3. Notification: Contractor is responsible for scheduling times for all inspections, tests, taking samples and similar activities
    - a. Contractor shall allow adequate time for inspection, monitoring and needed corrections before proceeding to the next construction stage.
    - b. Notify Owner's Representative at least two (2) working days in advance before inspection will be required. Specific instances for notifications of Design Professionals will be determined at the Pre-Construction Conference.
    - c. Contractor shall notify Agencies, Special Inspector and Testing Agency with not less than two (2) working days advance notice for all inspections and tests, to allow for laboratory assignment of personnel and scheduling of test.
      - i. Contractor is responsible for costs incurred when testing agency is notified for services but work is not ready or complete for inspection, testing, taking samples, and/or similar activities.
      - ii. Contractor to reimburse City for any cost incurred such as laboratory personnel or travel expenses due to lack of adequate coordination.



- d. Notification by Testing Agency of Deficiency: Notification shall consist of direct verbal conversation in person or by telephone within one (1) hour of detection of the deficiency. Copies of draft field notes shall be left at the site with the Contractor and the Clerk of the Works, if any. Copies of the same shall be delivered or emailed to the Owner's Representative within two (2) hours. A written report shall be delivered or emailed to all parties noted above within two (2) working days. A final fully reviewed and edited report shall be delivered to all parties within five (5) working days.
- 4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
- 5. Inspections, including geotechnical monitoring, shall not relieve the Contractor from responsibility for correctness, completeness, and quality of their work.
- C. Special Tests and Inspections: City will engage a testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of City.
  - 1. Testing Agency will notify Design Professional and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
  - 2. Testing Agency will submit a certified written report of each test, inspection, and similar quality-control service to Design Professional with copy to Contractor and to authorities having jurisdiction.
  - 3. Testing Agency will submit a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
  - 4. Testing Agency will interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
  - 5. Testing Agency will retest and reinspect corrected work.
- D. Special Inspections at the City's Option: City reserves the right to invoke testing procedures at any time and as often as the City deems necessary. The City may engage qualified independent testing and inspecting agencies to perform inspections and prepare reports on the following:
  - 1. Through Penetration Firestop Systems
  - 2. Paint and High Performance Coatings
  - 3. Additional testing at the City's option
- E. Manufacturer's Field Services: Where indicated, Contractor to engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Provide copies of report results to Contractor and Owner's Representative.

- F. Retesting: The Contractor is responsible for retesting where results of inspections, tests, or other quality-control services prove unsatisfactory and indicate noncompliance with Contract Document requirements, regardless of whether the original test was Contractor's responsibility.
  - 1. The cost and time of retesting construction, revised or replaced by the Contractor, is the Contractor's responsibility where required tests performed on original construction indicated noncompliance with Contract Document requirements.
- G. Testing Agency Responsibilities: Cooperate with Design Professional and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
  - 1. The agency shall perform whatever inspections, tests and sampling is necessary to reasonably ensure that the Work is in conformance with the Contract Documents, industry standards and requirements of the authority having jurisdiction, whichever is the most stringent. Inspection and testing methods shall be of the highest quality in conformance with appropriate recognized standards such as those published by ACI, ASTM, ANSI, ICBO, etc.; as specified in the technical Sections of this manual and as required by the authority having jurisdiction.
  - 2. Notify Design Professional and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  - 3. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
  - 4. Submit a certified written report of each test, inspection, and similar quality-control service directly to the Contractor, City, Design Professional, and agencies having jurisdiction.
  - 5. Perform additional tests as required by the Design Professional, Structural Engineer, or City or other entity as included in the Contract Documents or as otherwise directed by the City in writing.
  - 6. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
  - 7. Do not perform any duties of Contractor.
  - 8. Do not approve or accept any portion of the Work unless specifically authorized in writing by the City, with the knowledge of the Design Professional.
- H. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
  - 1. Contractor shall be responsible for coordinating testing services so as to ensure tests are performed and reports delivered in a manner not to cause delays to the Work.

2. Furnish records, drawings, certificates, and similar data as may be required by the testing and inspection personnel to assure compliance with the Contract Documents.
3. Furnish free access to various parts of the Work and assist testing and inspection personnel in the performance of their duties at no additional cost to the City or Testing Agency.
4. Furnish incidental labor and facilities necessary to facilitate inspections and tests.
5. Take adequate quantities of representative samples of materials that require testing or assist the agency in taking samples.
6. Provide facilities for storage and curing of test samples.
7. Deliver samples to testing laboratories, except where City directly hires the testing agency.
8. Provide the agency with a preliminary design mix proposed for use for material mixes that require control by the testing agency.
9. Provide security and protection of samples and test equipment at the Project Site.

I. Liability of Testing Agency

1. The City shall not be held liable for the actions (or lack of action) of the testing laboratory(s). The commencement of Work by the Contractor shall indicate their understanding and agreement that all disputes or claims which may develop between the City's testing laboratory(s) and the Contractor shall be resolved directly between those two parties without involvement or responsibility on the part of the City, unless prior agreement is made in writing.
2. Contractor shall advise the City of faulty inspections or tests performed by the testing laboratory, but City shall not be held responsible for problems, damages, delays, replacement of defective work, etc. which may occur as a result of the testing laboratory's faulty work in which case the Contractor's sole recourse shall be against the testing laboratory or other party at fault, but not against the City.
3. Nothing in these specifications shall be construed as preventing the Contractor from hiring a separate testing laboratory to perform testing laboratory services. However, the City's testing laboratory inspections and tests shall be the basis for acceptance or rejection of the Work by the City unless such inspections or tests are proven to be in error.

J. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

- K. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within thirty (30) calendar days of date established for the Notice to Proceed.
1. Distribution: Distribute schedule to City, Design Professional, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.
- L. Specific Contractor Services: Include but are not limited to:
1. Make available at project site to the appropriate Testing Agency or Soils Engineer safe access and working environment, adequate quantities of samples of materials proposed to be used which require testing.
  2. Provide the Testing Agency with the approved design mix to be used for concrete, mortar, grout, and other material mixes which require testing by the testing laboratory.
  3. Furnish copies of product test reports performed by Contractor as required by Contract Documents.
  4. Furnish incidental facilities necessary for the following:
    - a. To obtain and handle samples at the project site or at the source of the product to be tested
    - b. To facilitate inspections, geotechnical monitoring, and tests
    - c. For storage and curing of the test samples
    - d. Electrical power and water required for testing procedures
- M. Defective Work:
1. When tests or inspections indicate non-compliance with the Contract Documents, subsequent retesting occasioned by such non-compliance shall be performed by the same personnel as performed the initial tests or inspections, and the cost therefore shall be paid for as stipulated under the conditions or the Contract.
  2. Remove and replace any work found defective or not in compliance with the Contract Documents at no additional cost to City, and furnish notice for retesting as specified hereinbefore.
- N. Related Work Specified Elsewhere: The Contractor's responsibility includes certification of products, inspections and/or tests required as part of Contractor Work described in **Divisions 02-35**, or because of defective or non-conforming Work, qualification of non-specified materials, and /or ill-timed notices regarding originally scheduled inspections of the work.

## **PART 2 PRODUCTS**

(NOT USED)

**PART 3 EXECUTION****3.01 SCHEDULE OF REQUIRED ACTIVITIES****A. Geotechnical Inspections****1. General**

- a. Prior to performing excavations or fill operations, and preparation for building, foundations, placement of subsurface drainage systems, base course installation for asphalt pavement or slabs on grade, utility bedding, or other major excavations, the Contractor shall notify the City and Design Professional and facilitate inspection of site by City's Soils Engineer or Testing Agency to ascertain that conditions encountered are in conformance with the Contract Documents for depth of foundation, influence of groundwater, requirements for drainage for foundations, excavations, cut, fill, slopes and soil conditions.
- b. Placement and compaction of all structural fill and all structural backfill shall be inspected by City's Soils Engineer (Geotechnical Consultant) or Testing Agency.

**2. Testing:**

- a. Within the provisions of the technical specifications for earthwork testing and sampling, Contractor shall cooperate with the Testing Agency to perform testing or sampling for verification of conditions as noted above. Moisture Density tests, in-place density tests, and other tests may be performed as required by the Contract Documents or International Building Code, as adopted by the jurisdiction having authority, and to verify Contractor's earthwork operations.
- b. Conform to ASTM D1557. Take in-place density tests as follows, unless otherwise indicated in the technical specifications:
  - i. Compacted fills, subgrades, sub-bases and base courses, other than under concrete slabs on grade. Not less than one (1) test per 1,000 square feet for each lift.
  - ii. Utility trench bottoms, backfill of utility trenches under all concrete slabs on grade, foundation walls, and asphalt paving types. Not less than three (3) tests per 100 linear feet of trench for each lift.
  - iii. Fills under foundation walls and footings, and backfill of foundation walls and footings; not less than one (1) test per 100 linear feet of wall footing for each lift.
- c. Analytical Sampling: The Design Professional or City representative will collect analytical samples to confirm limits of contaminated soil removal or for soil profiling. The Contractor may be required to suspend work or shift operations to other areas while waiting for analytical sample results.

B. Paving

1. Asphalt Paving:

- a. Density testing shall be performed in the field for each day of paving and for each lift of pavement placed. At a minimum, one (1) density tests shall be performed at each paving location for each lift of pavement.
- b. Core Tests: One core sample per every 1,000 square yards or less of installed pavement, but in no case will fewer than three cores be taken.

C. Irrigation, Field Testing and Performance Testing: Refer to **Divisions 32 and 33 Irrigation**.

D. Topsoil Testing: Submit topsoil samples to a certified soil testing laboratory, provide written copy of test results of fertility, nutrient and weed composition.

E. Cast-in-Place Architectural Concrete: Contractor shall engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures. Field Quality Control to be performed as required by **03 30 00 CAST-IN-PLACE CONCRETE**.

F. Concrete Stain: Contractor shall engage a qualified independent testing agency to perform tests confirming compliance with specified performance criteria.

G. Structural Cast-In-Place Concrete:

1. General: Testing will be performed as required by International Building Code, as adopted by the agency having jurisdiction, and these Specifications. Tests and inspections may include, but not necessarily be limited to, the following:

a. General:

- i. Inspection of reinforcing steel and embedded items in place. Verify proper placement of reinforcing bars, fabric, and spirals prior to placement of concrete; check condition of surfaces of reinforcing and embedded items for bond integrity with concrete; verify placement locations, sizes and anchorage of all items embedded in concrete.
- ii. Concrete formwork including configuration, form and steel cleanliness. Inspect erected formwork for conformance with approved drawings, for design and seal of form joints, and for type and location of form ties.
- iii. Reinforced concrete inspection and material testing shall be made in accordance with ACI 301 Chapter 16, Testing, and Chapter 17, Evaluation and Acceptance of Concrete, and appropriate ASTM Standards.

b. Test materials for compliance with Specifications. Review and check proposed mix designs. Conduct tests of concrete in accordance with the following procedures:

- i. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C94.
  - ii. Slump: ASTM C143; one test for each concrete load at point of discharge; and one test for each set of compressive strength test specimens.
  - iii. Air Content: ASTM C173; volumetric method and ASTM C21 pressure for normal weight concrete; one (1) for each set of compressive strength test specimens.
  - iv. Concrete Temperature: Test hourly when air temperature is 40 degrees F and below, and when 80 degrees F and above; and each time a set of compression test specimens made.
  - v. Compression Test Specimen: ASTM C31; one (1) set of six (6) standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens except when field-cured test specimens are required.
  - vi. Compressive Strength Tests: ASTM C39; one (1) set for each 100 CY or fraction thereof, of each concrete class placed in any one day or for each 5,000 SF of surface are placed; two (2) specimens tested at seven (7) calendar days, one (1) specimen tested at fourteen (14) calendar days, two (2) specimens tested at twenty eight (28) calendar days, and one (1) specimen retained in reserve for later testing if required.
    - I. When frequency of testing will provide less than five (5) strength tests for a given class of concrete, conduct testing from at least five (5) randomly selected batches or from each batch if fewer than five (5) are used.
    - II. When total quantity of a given class of concrete is less than fifty (50) CY, strength test may be waived by City if, in their judgment, adequate evidence of satisfactory strength is provided.
    - III. When strength of field-cured cylinders is less than 85% of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
    - IV. Strength level of concrete will be considered satisfactory if averages of sets of three (3) consecutive strength test results equal or exceed specified compressive strength, and no individual strength test result falls below specified compressive strength by more than 500 psi.
2. Test Results: Test results will be reported in writing and expedited to the agency having jurisdiction, Contractor, Design Professional, Structural Engineer, and City. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at twenty eight (28) calendar days, concrete mix proportions and materials; compressive breaking strength and type of break for both 7-day tests and 28-day tests.

3. Additional Test: The testing service will make additional tests of in-place concrete, as directed by City, when test results indicate specified concrete strengths and other characteristics have not been attained in the structure. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42, or by other methods as directed. Contractor shall pay for such tests conducted, and any other additional testing as may be required, when unacceptable concrete is verified.
  4. Patching: Where core test results are satisfactory, fill core holes with non-shrink patching grout to meet or exceed the strength of the adjoining concrete, and finish to match adjoining concrete surface.
- H. Welding: Verify conformance with applicable Sections of Division 05 and notes on Structural Drawings.
- I. Structural Steel Framing & Fabrications
1. General: Tests will be performed as required by International Building Code, Section 1704.3, as adopted by the jurisdiction having authority and these specifications.
  2. Shop Bolted Connections: Inspect in accordance with AISC specifications.
  3. Shop Welding: Inspect and test during fabrication of structural steel assemblies, as follows:
    - a. Verify use of "Washington Association of Building Officials" (WABO) certified welders, and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
    - b. Perform visual inspection of all welds including fillet welds.
    - c. Perform tests of complete penetration welds as required by technical specifications as follows. Inspection procedures listed are to be used at Testing Laboratory's option.
      - i. Liquid Penetrant Inspection: ASTM E 165.
      - ii. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
      - iii. Ultrasonic Inspection: ASTM E 164.
      - iv. Radiographic Inspection: ASTM E 94.
  4. Field Bolted Connections: Inspect in accordance with AISC specifications.
  5. Field Welding: Inspect and test during erection of structural steel as follows:
    - a. Verify use of "Washington Association of Building Officials" (WABO) certified welders, and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies and submit copies of such reports to Contractor, Design Professional and City.



- b. Perform visual inspection of all welds including fillet welds.
- c. Perform tests of welds as required by technical specifications as follows:
  - i. Radiographic Inspection: ASTM E94 and ASTM E142; minimum quality level “2-2T.
  - ii. Ultrasonic Inspection: ASTM E164.
- 6. Testing Program Summary: Testing Agency special inspector shall submit a summary of the proposed testing program for review and approval; submit directly to Contractor, Design Professional, City, Structural Engineer and the jurisdiction having authority.
- J. Rough Carpentry: Refer to 06 10 00 - Rough Carpentry.
- K. Traffic Coatings: Refer to 07 18 00 - Traffic Coatings.
- L. Through-Penetration Firestop System: City will engage a qualified independent inspecting agency to inspect through-penetration firestop system and prepare test reports.
- M. Joint Sealants:
  - 1. Refer to 07 92 00 - Joint Sealants for field-adhesion testing.
- N. Miscellaneous:
  - 1. General: Provide other special inspections required by International Building Code as adopted by the agency having jurisdiction for structural or other work, or requested by City.
  - 2. Additional Testing Services: Additional testing which may be performed by the City’s independent testing agency, specified elsewhere in Contract Documents.

### **3.02 MECHANICAL & ELECTRICAL WORK SUB-CONTRACTS**

- A. Inspection and tests required for Mechanical and Electrical Work are covered under Sections of Divisions 15 and 16 respectively; no work required under this Sections.

**END OF SECTION**

## **01 42 00 REFERENCE STANDARDS**

### **PART 1 GENERAL**

#### **1.01 SUMMARY**

- A. Clarification of product specification standards.
- B. Listing of applicable Reference Standards used in Contract Documents. These are indicated by acronym, full title, and address.

#### **1.02 NUMBER OF SPECIFIED ITEMS REQUIRED**

- A. Whenever in the Project Manual, an article, device or piece of equipment is referred to in the singular number, such reference applies to all and as many such articles as are shown on the drawings or required to complete the installation.

#### **1.03 SPECIFICATION OF MANUFACTURER**

- A. Whenever in the Project Manual, an article, device or piece of equipment is referred to by Manufacturer Model Number, Serial Number or Manufacturer's standards product indication, the specifications of that article, device or piece of equipment shall hereby be considered within the Project Manual. For purposes of substitution, such specifications will be deemed to be the basis for the City's decisions for substitution approval or disapproval.

#### **1.04 QUALITY ASSURANCE**

- A. Any material and/or procedure specified by reference of the number, symbol or title of a specified standard such as a commercial standard, Federal specification, a trade association standard, technical society standard, or other similar standard, shall comply with the requirements of the latest revision thereto and any amendment or supplement thereto, in effect on the date of Invitation for Bids, except as limited to type, class or grade, or modified in such reference. The standards referred to, except as modified in the Project Manual, shall have full force and effect as though printed in the Project Manual.
- B. When required by individual Project Manual Section, obtain copy of standard, catalog or excerpt. Maintain digital copies at jobsite during submittals, planning, and progress of the specific work through final acceptance of the work by the City.
- C. Should specified reference standards conflict with Contract Documents, request clarification from Owner's Representative before proceeding.
- D. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

#### **1.05 SCHEDULE OF REFERENCES**

- A. Listing may not be complete. Where not shown, request information from Owner's Representative during bidding. Specified acronym may be listed/Sweet's Architectural/Mechanical/Electrical files, or as generally understood and applicable within the construction industry.

## **1.06 ASSOCIATIONS & STANDARDS**

AA - Aluminum Association

818 Connecticut Avenue, N.W.

Washington, DC 20006

AAMA American Architectural Manufacturers' Association

2700 River Road

Des Plaines, IL 60018

ANLA - American Nursery and Landscape Association

2130 Stella Court

Columbus, OH 20006

AASHTO - American Association of State Highways & Transportation Officials

444 North Capital Street

Washington, DC 20001

ACI - American Concrete Institute

Box 19150

Rexford Station

Detroit, MI 48219

AGA - American Gas Association

605 Third Avenue

New York, NY 10038

AIA - American Institute of Architects

1735 New York Avenue N.W.

Washington, DC 20006

AIA - American Insurance Association

85 John Street

New York, NY 10038

475 Wolf Ledges Parkway

Akron, OH 44311

AIMA - Acoustical & Insulating Materials Association

111 W. Washington Street

Chicago, IL 60002

AISC - American Institute of Steel Construction

400 N. Michigan Avenue

Chicago, IL 60611

AISI - American Iron & Steel Institute

1000 – 16th Street N.W.

Washington, DC 20036

AITC - American Institute of Timber Construction

333 West Hampden Avenue

Englewood, CO 80110

ALSC - American Lumber Standards Committee

P.O. Box 210

Germantown, MD 20874

ANSI - American National Standard Institute

1430 Broadway

New York, NY 10018

AOAC - American of Official Analytical Chemists

1111 North 19th Street Suite 210

Arlington, VA 22202

AOA - Association of Official Seed Analysts

c/o Robt. Trent

2240 Kellogg Lane

Boise, Idaho 83702

APA - American Plywood Association

P.O. Box 11700

Tacoma, WA 98411

APAW - Asphalt Paving Association of Washington, Inc.

1200 Westlake North

Seattle, WA 98109

APWA - American Public Works Association

Washington State Chapter

Available: University Book Store,

P.O. Box C-5009

Seattle, WA 98105

Tel (206) 634-3400

ARIB - Asphalt Roofing Industry Bureau

757 Third Avenue

New York, NY 10018

American Standards Association

10 East 40th Street

New York, NY 10018

ASA - American Subcontractor's Association

1004 Duke Street

Alexandria, VA 22314

ASLA - American Society of Landscape Architects

636 Eye Street NW

Washington, D.C. 20001-3736

ASM - Architectural Specifications Manual, published by Specification Services/Painting and Decorating Contractors Of America

27606 Pacific Highway South

Kent, WA 98032

ASCE - American Society of Civil Engineers

345 East 47th Street

New York, NY 10017

ASHRAE - American Society of Heating, Refrigeration, & Air Conditioning Engineer, Inc.

1791 Tullie Circle N.E.

Atlanta, GA 30329

ASME - American Society of Mechanical Engineers

345 East 47th Street

New York, NY 10017

ASPA - American Sod Producers Association

4415 West Harrison Street, Suite 309C

Hillside, IL 60162

ASTM - American Society for Testing & Materials

1916 Race Street

Philadelphia, PA 19103

AWCI - Association of Wall and Ceiling Industries

25 K Street NE, Suite 300

Washington, DC 20009

AWI - Architectural Woodwork Institute

Chesterfield House

2310 S. Walter Reed Drive

Arlington, VA 22206

AWPA - American Wood Preservers' Association

7735 Old Georgetown Road

Bethesda, MD 20014

AWPB - American Wood Preservers' Bureau

P.O. Box 6085

Arlington, VA 22206

AWPI - American Wood Preservers Institute

1651 Old Meadow Road

McLean, VA 22101

AWS - American Welding Society

550 NW LeJeune Road

Miami, FL 33126

AWWA - American Water Works Association

6666 W. Quincy Avenue

Denver, CO 80235

BHMA - Builders Hardware Manufacturers Association

60 East 42nd Street

New York, NY 10017

BIA - Brick Institute of America

11490 Commerce Park

Reston, VA 22029

CISCA - Ceilings and Interior Systems Contractors Association

1800 Pickwick Avenue

Glenview, IL 60025

CLFMI - Chain Link Fence Manufacturers Institute

1101 Connecticut Avenue NW, #700

Washington, DC 20036

CRSI - Concrete Reinforcing Steel Institute

933 Plum Grove Road

Schaumburg, IL 60195

2CS - Commercial Standard of U.S. Department of Commerce,

Business & Defense Services

900 First Avenue

Seattle, WA 98104

CSI - Construction Specification Institute

601 Madison Street

Alexandria, VA 22314

DHI - Door & Hardware Institute

7711 Old Springhouse Road

McLean, VA 22102-3474

DFPA - Douglas Fir Plywood Association – See APA

(now known as American Plywood Association)

Department of Commerce

Washington, DC 20234

DSHS - Department of Social and Health Services

Office of Licensing and Certification

Health Facilities Survey Section

1112 South Quince, Mail Stop ET-31

Olympia, WA 98504

EPA - Environmental Protection Agency

401 M Street SW

Washington, DC 20460

Northwest Region:

1200 Sixth Avenue

Seattle, WA 98101

FGMA - Flat Glass Marketing Association

3310 West Harrison

White Lakes Professional Building

Topeka, KS 66611

FM - Factory Mutual System

1151 Boston-Providence Turnpike

P.O. Box 688

Norwood, MA 02062



FS - Federal Specification

GSA - Business Center

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1603 Orrington Avenue, Suite 1210

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Reston, VA 22090

IBC - International Building Code

International Code Council, Inc.

4051 West Flossmoor Road

Country Club Hills, IL 60478-5795

IEEE - Institute of Electrical & Electronic Engineers, Inc.

1828 L Street NW, Suite 1202

Washington, DC 20036-5104

IESNA - Illuminating Engineering Society of North America

120 Wall Street, Floor 17

New York, NY 10005

IPCEA - Insulated Power Cable Engineers Association

P.O. Box P

South Yarmouth, MA 02664

IRIA - Industrial Risk Insurers Association

85 Woodland Street

Hartford, CT 06102

MIL - Military Specification Naval Publication and Forms Center

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Chicago, IL 60601

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Quincy, MA 02269

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Seattle, WA 98101

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Government Printing Office

Washington, DC 20203

PSAPCA - Puget Sound Air Pollution Control Agency

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Northbrook, IL 60062

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Seattle, WA 98101

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Portland, OR 97223

WSDA - Washington State Department of Agriculture

406 General Administration Building AXL-41

Olympia, WA 98504

Washington State Department of Transportation Department of General Administration – Purchasing Department

Room 216, General Administration Building

Olympia, WA 98504

WWPA - Western Wood Products Association

1500 Yeon Building

Portland, OR 97204

- A. Names and addresses of other organizations appearing in the Technical Specification Sections where their products are specified may be listed in Sweet's Architectural File.

**PART 2 PRODUCTS**

(NOT USED)

**PART 3 EXECUTIVE**

(NOT USED)

**END OF SECTION**

## **01 43 43 SPECIAL INSPECTIONS AND TESTING**

### **PART 1 GENERAL**

#### **1.01 GENERAL REQUIREMENTS**

- A. Special inspections shall conform to Chapter 17 of the International Building Code and the referenced codes and standards listed herein.

#### **1.02 SUMMARY**

- A. Section includes code-required special inspection and testing requirements for the following items:
  - 1. Soils
  - 2. Driven deep foundation elements
  - 3. Fabrication
  - 4. Concrete
  - 5. Masonry
  - 6. Structural Steel
  - 7. Steel deck
  - 8. Stainless steel
  - 9. Cold-formed steel framing
  - 10. Wood
  - 11. Sprayed fire-resistant materials and intumescent fire-resistant coatings
  - 12. Exterior Insulation and finish systems
  - 13. Fire-resistant penetrations and joints
  - 14. Smoke control systems
  - 15. Seismic resistance of nonstructural components

#### **1.03 REFERENCED CODES AND STANDARDS**

- A. Building Code Requirements for Masonry Structures, TMS 402-2016
- B. Building Code Requirements for Structural Concrete, ACI 318-19
- C. International Building Code, 2021 IBC
- D. North American Specification for the Design of Cold-Formed Steel Structural Members, 2016 Edition, with Supplement 2, 2020 Edition, AISI S100-16 w/ S2-20

- E. Qualification of Post-Installed Adhesive Anchors in Concrete, ACI 355.4-19
- F. Qualification of Post-Installed Mechanical Anchors in Concrete, ACI 355.2-19
- G. Seismic Provisions for Structural Steel Buildings, AISC 341-16
- H. Special Design Provisions for Wind & Seismic, AWC SDPWS-2021
- I. Specification for Masonry Structures, TMS 602-2016
- J. Specification for Structural Joints Using High-Strength Bolts, RCSC-2014
- K. Specification for Structural Steel Buildings, AISC 360-16
- L. Standard for Quality Control and Quality Assurance for Installation of Steel Deck, SDI-QA/QC-2017
- M. Structural Welding Code – Steel, AWS D1.1 - 2015
- N. Structural Welding Code – Sheet Steel, AWS D1.3 –2008
- O. Structural Welding Code – Reinforcing Steel Including Metal Inserts and Connections In Reinforced Concrete Construction, AWS D1.4 - 2018
- P. Structural Welding Code – Stainless Steel, AWS D1.6 – 2017
- Q. Structural Welding Code – Seismic Supplement, AWS D1.8 - 2016

#### **1.04 DEFINITIONS**

- A. ACI: American Concrete Institute
- B. AISC: American Institute for Steel Construction
- C. AWC: American Wood Council
- D. AWS: American Welding Society
- E. Building Official: The officer or other designated authority charged with the administration and enforcement of the building code
- F. Continuous Special Inspection: Special inspection by the Special Inspector who is present when and where the work to be inspected is being performed
- G. ICC: International Code Council
- H. IAPMO: International Association of Plumbing and Mechanical Officials
- I. Observe: Where noted in the Special Inspection tables at the end of this Section, the Special Inspector shall observe these items on a random basis. Operations need not be delayed pending these inspections.



- J. Perform: Where noted in the Special Inspection tables at the end of this Section, the Special Inspector shall perform these tasks for each elements.
- K. Periodic Special Inspection: Special inspection by the Special Inspector who is intermittently present where the work to be inspected has been or is being performed.
- L. RCSC: Research Council on Structural Connections
- M. SDI: Steel Deck Institute
- N. Special Inspector: A qualified person employed or retained by a Special Inspection and Testing Agency and approved by the Building Official as having the competence necessary to inspect a particular type of construction requiring special inspection.
- O. TMS: The Masonry Society
- P. WABO: Washington Association of Building Officials

## **1. 05 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Special Inspection and Testing Agency and associated personnel. Qualification Data shall include a copy of the scope of accreditation.
- B. Field quality-control reports: The Special Inspection and Testing Agency shall furnish inspection and test reports for each inspection and test to the Building Official, Structural Engineer of Record, Design Professional, Contractor and Owner.
  - 1. Final Report: The Special Inspection and Testing Agency shall submit a final report stating that the work requiring special inspection was inspected and is in conformance with the approved construction documents and that all discrepancies noted in the inspection reports have been corrected.
- C. Statement of Contractor Responsibility: For seismic design category D structures, the Contractor is responsible for the construction of the main wind or seismic force-resisting system or a wind or seismic force-resisting component listed in herein. The Contractor shall submit a written statement of responsibility to the Building Official and the Owner prior to commencement of work on the system or component. The Contractor's Statement of Responsibility shall contain the following:
  - 1. Acknowledgement of awareness of the special requirements contained in the statement of special inspections
  - 2. Acknowledgement that control will be exercised to obtain conformance with the construction documents approved by the Building Official
  - 3. Procedures for exercising control within the Contractor's organization
  - 4. The method and frequency of reporting and distribution of the reports

5. Identification and qualification of the person(s) exercising such control and their position(s) in the organization

#### **1.06 QUALITY ASSURANCE**

- A. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C1077 (concrete), ASTM D3740 (soils), ASTM E329 (materials) and ASTM E543 (non-destructive) for testing indicated
- B. Welding Inspector Qualifications: AWS D1.1, Section 6.1.4.1(1) and WABO
- C. Mechanical Post-installed Anchor Inspector Qualifications: Certified by the ACI Post-installed Anchor Inspector program (ACI CPP 681.2) or other approved program with equivalent requirements
- D. Adhesive Post-installed Anchor Inspector Qualifications: Certified by the ACI Adhesive Anchor Installation Inspector program (ACI CPP 681.1), ACI Post-installed Concrete Anchor Installation Inspector program (ACI CPP 681.2) or other approved program with equivalent requirements
- E. Geotechnical Design Profession Qualifications: A Design Professional licensed in the State where the project is located and qualified according to ASTM D3740

#### **1.07 FIELD CONDITIONS**

- A. The construction or work for which special inspection or testing is required shall remain accessible and exposed for special inspection or testing purposes until completion of the required special inspections or tests.

#### **1.08 PREINSTALLATION CONFERENCE**

- A. Conduct conference at Luther Burbank Park, 2048 84th Avenue SE.
- B. Coordinate attendance of representatives of each entity directly concerned with cast-in-place concrete, including the following:
  1. General Contractor's Superintendent
  2. Owner or Owner's Representative
- C. Design Professional
- D. Structural Engineer
- E. Special Inspector
- F. Building Official
- G. Review the following:
  1. Special inspection requirements of the project

## **PART 2 PRODUCTS**

(NOT USED)

## **PART 3 EXECUTION**

### **3.01 SPECIAL INSPECTIONS AND TESTING**

- A. Special Inspectors from the Special Inspection and Testing Agency shall observe the indicated work for compliance with the approved construction documents.
  - 1. All discrepancies shall be brought to the attention of the Contractor for correction and noted in the field quality-control reports.
  - 2. Issues requiring immediate corrective actions or engineering input are to be brought to the engineer's attention immediately upon discovery.
- B. Special Inspections and Testing Schedule: Refer to the tables at the end of this Section for required special inspections and testing.
- C. Concrete Testing Requirements: Concrete testing indicated at the end of this section meets the minimum requirements for structural testing to be provided by the Special Testing and Inspecting Agency. Additional testing for construction consideration is not indicated in the tables and shall be determined by the Contractor and provided at the Contractor's expense.
- D. Post-installed Anchor Inspection Requirements
  - 1. Where periodic inspection is allowed in accordance with the anchor ICC/IAPMO evaluation report, inspections shall be as follows:
    - a. For all anchors, prior to concealment, verify anchor type, anchor dimensions, anchor spacing and edge distances.
    - b. For each anchor type and size, Special Inspector shall be onsite to continuously inspect a minimum of the first 10 anchors installed by each installer for conformance with ICC/IAPMO evaluation report. Provided all anchors are installed correctly per the manufacturer's written instructions, provide periodic inspection on a minimum of 10% of the next 1,000 anchors by each installer and a minimum 5% of the remaining anchors by each installer. Inspections shall occur a minimum of once per week at a random time while anchor installation is ongoing. Any non-compliance issues shall reset the inspection requirements to 10 continuous inspections. Non-compliant anchors shall be brought to the attention of the Structural Engineer of Record for review and shall be brought into compliance by either testing or re-installation.
    - c. Inspection reports shall identify names of installers.
    - d. Special Inspector shall provide documentation at the end of anchor installations stating that the minimum number of anchors were inspected.

**END OF SECTION**

**01 50 00 TEMPORARY FACILITIES AND CONTROLS**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Clarification of product specification standards.
- B. Listing of applicable Reference Standards used in Contract Documents. These are indicated by acronym, full title, and address.

**1.02 NUMBER OF SPECIFIED ITEMS REQUIRED**

- A. Whenever in the Project Manual, an article, device or piece of equipment is referred to in the singular number, such reference applies to all and as many such articles as are shown on the drawings or required to complete the installation.

**1.03 SPECIFICATION OF MANUFACTURER**

- A. Whenever in the Project Manual, an article, device or piece of equipment is referred to by Manufacturer Model Number, Serial Number or Manufacturer's standards product indication, the specifications of that article, device or piece of equipment shall hereby be considered within the Project Manual. For purposes of substitution, such specifications will be deemed to be the basis for the City's decisions for substitution approval or disapproval.

**1.04 QUALITY ASSURANCE**

- A. Any material and/or procedure specified by reference of the number, symbol or title of a specified standard such as a commercial standard, Federal specification, a trade association standard, technical society standard, or other similar standard, shall comply with the requirements of the latest revision thereto and any amendment or supplement thereto, in effect on the date of Invitation for Bids, except as limited to type, class or grade, or modified in such reference. The standards referred to, except as modified in the Project Manual, shall have full force and effect as though printed in the Project Manual.
- B. When required by individual Project Manual Section, obtain copy of standard, catalog or excerpt. Maintain digital copies at jobsite during submittals, planning, and progress of the specific work through final acceptance of the work by the City.
- C. Should specified reference standards conflict with Contract Documents, request clarification from Owner's Representative before proceeding.
- D. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

**1.05 SCHEDULE OF REFERENCES**

- A. Listing may not be complete. Where not shown, request information from Owner's Representative during bidding. Specified acronym may be listed/Sweet's Architectural/Mechanical/Electrical files, or as generally understood and applicable within the construction industry.

## **1.06 ASSOCIATIONS & STANDARDS**

AA - Aluminum Association

818 Connecticut Avenue, N.W.

Washington, DC 20006

AAMA American Architectural Manufacturers' Association

2700 River Road

Des Plaines, IL 60018

ANLA - American Nursery and Landscape Association

2130 Stella Court

Columbus, OH 20006

AASHTO - American Association of State Highways & Transportation Officials

444 North Capital Street

Washington, DC 20001

ACI - American Concrete Institute

Box 19150

Rexford Station

Detroit, MI 48219

AGA - American Gas Association

605 Third Avenue

New York, NY 10038

AIA - American Institute of Architects

1735 New York Avenue N.W.

Washington, DC 20006

AIA - American Insurance Association

85 John Street

New York, NY 10038

475 Wolf Ledges Parkway

Akron, OH 44311

AIMA - Acoustical & Insulating Materials Association

111 W. Washington Street

Chicago, IL 60002

AISC - American Institute of Steel Construction

400 N. Michigan Avenue

Chicago, IL 60611

AISI - American Iron & Steel Institute

1000 – 16th Street N.W.

Washington, DC 20036

AITC - American Institute of Timber Construction

333 West Hampden Avenue

Englewood, CO 80110

ALSC - American Lumber Standards Committee

P.O. Box 210

Germantown, MD 20874

ANSI - American National Standard Institute

1430 Broadway

New York, NY 10018

AOAC - American of Official Analytical Chemists

1111 North 19th Street Suite 210

Arlington, VA 22202

AOA - Association of Official Seed Analysts

c/o Robt. Trent

2240 Kellogg Lane

Boise, Idaho 83702

APA - American Plywood Association

P.O. Box 11700

Tacoma, WA 98411

APAW - Asphalt Paving Association of Washington, Inc.

1200 Westlake North

Seattle, WA 98109

APWA - American Public Works Association

Washington State Chapter

Available: University Book Store,

P.O. Box C-5009

Seattle, WA 98105

Tel (206) 634-3400

ARIB - Asphalt Roofing Industry Bureau

757 Third Avenue

New York, NY 10018

American Standards Association

10 East 40th Street

New York, NY 10018

ASA - American Subcontractor's Association

1004 Duke Street

Alexandria, VA 22314

ASLA - American Society of Landscape Architects

636 Eye Street NW

Washington, D.C. 20001-3736

ASM - Architectural Specifications Manual, published by Specification Services/Painting and Decorating Contractors Of America

27606 Pacific Highway South

Kent, WA 98032

ASCE - American Society of Civil Engineers



345 East 47th Street

New York, NY 10017

ASHRAE - American Society of Heating, Refrigeration, & Air Conditioning Engineer, Inc.

1791 Tullie Circle N.E.

Atlanta, GA 30329

ASME - American Society of Mechanical Engineers

345 East 47th Street

New York, NY 10017

ASPA - American Sod Producers Association

4415 West Harrison Street, Suite 309C

Hillside, IL 60162

ASTM - American Society for Testing & Materials

1916 Race Street

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Government Printing Office

Washington, DC 20203

PSAPCA - Puget Sound Air Pollution Control Agency

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P.O. Box 9863

Seattle, WA 98109

RFCI - Resilient Floor Covering Institute

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Princeton, NJ 08540

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Mt. Kisco, NY 10549

TSCA - Toxic Substance Control Agency (see PSAPCA)

UL - Underwriters' Laboratories

333 Pfingsten Road

Northbrook, IL 60062

USDA - United State Department of Agriculture

915 2nd Avenue

Seattle, WA 98101

WCLIB - West Coast Lumber Inspection Bureau

P.O. Box 23145

Portland, OR 97223

WSDA - Washington State Department of Agriculture

406 General Administration Building AXL-41

Olympia, WA 98504

Washington State Department of Transportation Department of General Administration – Purchasing Department

Room 216, General Administration Building

Olympia, WA 98504

WWPA - Western Wood Products Association

1500 Yeon Building

Portland, OR 97204

- A. Names and addresses of other organizations appearing in the Technical Specification Sections where their products are specified may be listed in Sweet's Architectural File.



**PART 2 PRODUCTS**

(NOT USED)

**PART 3 EXECUTION**

(NOT USED)

**END OF SECTION**

**01 57 13 TEMPORARY EROSION AND SEDIMENT CONTROL PLANNING AND EXECUTION****PART 1 GENERAL****1.01 SUMMARY OF WORK**

- A. Extent of Work: The work for “Temporary Erosion and Sediment Control (TESC) Planning and Execution” shall cover management and monitoring of non-stormwater and stormwater runoff during construction. This section also includes temporary site control fencing, turbidity curtain surrounding in-water work to contain floating surface debris/turbidity, and Water Quality Monitoring and Protection Plan (WQMPP) elements.
- B. The provisions and intent of the Contract, including the General Conditions, Supplementary Conditions and General Requirements apply to this work as specified.
- C. This work shall apply to all areas associated with contract work including, but not limited to the following:
  - 1. Work areas
  - 2. Equipment and material storage areas
  - 3. Staging areas
  - 4. Stockpiles
  - 5. Material loading and unloading areas

**1.02 DESCRIPTION OF WORK**

- A. The Work in this section includes the following:
  - 1. TESC: This item shall consist of planning, installing, inspecting, maintaining, upgrading, and removing TESC Best Management Practices (BMPs) as shown on the Drawings and per the Contractor’s TESC Plan or as directed by the Design Professional, to prevent pollution of air and water, and control, respond to, and manage eroded sediment and turbid water during the life of the contract.
  - 2. Turbidity Curtain: This work shall consist of placement and maintenance of turbidity curtains.
  - 3. Temporary Fencing: This work shall follow the limits of the work zones as shown on the Drawings. The Work includes the requirements for transporting, locating, and placing temporary fencing in accordance with these Specifications and within the lines and grades established by the City.
- B. Dewatering Treatment: This work includes providing all the labor, tools, equipment, material, and maintenance of pump and systems necessary to control the flow rate and water quality according to discharge permit requirements for groundwater from dewatering operations in accordance with the

Drawings, the Contractor's Dewatering Plan (see **Section 31 23 19 DEWATERING**) and these Specifications.

1. All dewatering water shall be treated to the threshold established in the Washington State Department of Ecology's (Ecology) Construction Stormwater General Permit (CSGP) and associated Administrative Order (obtained by the Owner and to be transferred to the Contractor) and pumped to discharge locations established in the permit and as indicated on the Drawings. Dewatering water must be tested as required by the CSGP and the associated Administrative Order to demonstrate compliance with discharge limits.
2. The Contractor shall provide a treatment system, which will treat construction surface runoff and dewatering water to meet the permit discharge benchmarks and limits established in these specifications, utilizing the site-specific subsurface reference information provided in Appendix B. The proposed Dewatering Treatment Plan must be submitted to and approved by the Engineer prior to use. Ecology must approve the use of chemicals (if any) associated with implementation of the Dewatering Treatment Plan prior to site dewatering or construction activities that would require discharge of treated water.

### **1.03 DEFINITIONS**

- A. BMP: Best Management Practice
- B. NPDES: National Pollutant Discharge Elimination System
- C. CESCL: Certified Erosion and Sediment Control Lead
- D. CEWMP: Contractor Erosion and Water Management Plan
- E. TESC: Temporary Erosion and Sediment Control
- F. WSDOT: Washington State Department of Transportation
- G. SWMMWW: Stormwater Management Manual for Western Washington
- H. USACE: United States Army Corps of Engineers
- I. Ecology: Washington State Department of Ecology
- J. WQMPP: Water Quality Monitoring and Protection Plan
- K. CSGP: Construction Stormwater General Permit
- L. SWPPP: Stormwater Pollution Prevention Plan

### **1.04 GOVERNING CODES, STANDARDS, AND REFERENCES**

- A. The following guidance documents and requirements apply to this work:

1. Washington State Department of Ecology Stormwater Management Manual for Western Washington (SWMMWW), 2019.
2. Washington State Department of Ecology Construction Stormwater Permit
3. Washington State Department of Transportation (WSDOT) - Standard Specifications for Road, Bridge and Municipal Construction and Amendments (current edition).
4. The following reference documents are described herein this section and available in Appendix B:
  - a. RI/FS/CAP Report
  - b. Water Quality Monitoring and Protection Plan

#### **1.05 SUBMITTALS**

- A. As part of the required Preconstruction Submittals, the Contractor shall submit a CEWMP, which shall include the following major elements described below:
  1. Temporary Erosion & Sedimentation Control (TESC) Plan
  2. Dewatering Treatment Plan (see Section 31 23 19 DEWATERING)
  3. Temporary Stormwater Reroute Plan (if necessary)
- B. CEWMP – General Requirements. The CEWMP shall demonstrate the Contractor’s methods to install, maintain and upgrade all erosion prevention, containment and countermeasures of BMPs during the life of the contract, along with temporary stormwater reroutes and groundwater dewatering. The CEWMP shall, at a minimum, include and address the following:
  1. Site Description and Drawings.
  2. Contractor provided CESCL Control Personnel.
  3. Schedule and Sequencing.
  4. TESC Surface Runoff BMP Installation, Maintenance, and Inspection.
  5. Record keeping - Revise and modify the CEWMP during the life of the contract and maintain records.
  6. BMP Removal.
  7. Emergency Response.
  8. Fugitive Dust Planning.
  9. Utilities Planning and Reroute Plan.
  10. Educate all Contractor and subcontractor staff in environmental compliance issues at weekly meetings and document attendance and content.

11. Mark Pavement Removal and Clearing Limits.
  12. Establish Construction Entrance.
  13. Prevent Erosion and Sediment Transport from the Site.
  14. Stabilize Soils.
  15. Protect Storm Drains and Develop a Temporary Stormwater Reroute Plan as needed.
  16. Control Pollutants.
  17. Control dewatering flows and treatment systems consistent with the Dewatering Plan (see Section 31 23 19 DEWATERING).
  18. Minimize Open Trenches to the maximum extent practicable.
  19. Perform monitoring of site discharges and report to the Design Professional as indicated in these Specifications.
  20. Contain, cleanup and dispose of all accumulated sediment at an approved disposal facility.
  21. Perform other work shown on the project Drawings, in the Contractor Erosion and Water Management Plan or as directed by the Design Professional or City.
  22. Inspect to verify compliance with the CEWMP requirements including BMPs; facilitate, participate in, and implement corrective actions resulting from inspections conducted by others, including outside Agencies, Design Professional, and the City Representatives.
- C. More specific requirements for the three main elements of the CEWMP include the following:
1. TESC Plan
    - a. Responsible personnel, contact info and qualifications including Contact name, mobile phone, e-mail and address information for CESCL qualified personnel managing the site surface runoff, per requirements of these Specifications.
    - b. List of materials and equipment, and narrative of TESC and water quality protection approach, and overall management of the TESC water, including all major work elements described in paragraph 3.03 of this section.
    - c. Contractor shall submit sampling logs with daily reports and notify the Design Professional for deliveries, sweeping activities and dust control activities.
    - d. Contractor shall submit approved disposal locations for process water, cement slurry, asphalt cuttings, drilling fluids and any other waste materials
  2. Dewatering Treatment Plan

- a. General Requirements:
  - i. The Contractor shall design and submit for review and approval a Dewatering Treatment Plan. (See Section 31 23 19 DEWATERING.)
  - ii. The Contractor's Dewatering Treatment Plan shall include: turbidity control, oil/TPH control, well construction, disposal of drilling soils and fluids, well development and groundwater discharge water quality during well development, as well as subsequent methods proposed for handling the dewatering discharge.
  - iii. The Contractor shall not begin dewatering operations until the Dewatering Treatment Plan and CEWMP is approved by the Design Professional.
  - iv. The Contractor shall not begin dewatering operations until the Dewatering Treatment Plan and SWPPP is approved by Engineer. Ecology must approve the use of chemicals (if any) associated with implementation of the Dewatering Treatment Plan prior to site dewatering or construction activities that would require discharge of treated water.
  - v. Contractor shall submit BMP selection, maintenance schedule, monitoring and reporting plan to achieve discharge benchmarks.
  - vi. The Contractor shall submit contact name, mobile phone, fax, and e-mail and address information for CESCL qualified personnel managing, operating, and monitoring the site dewatering system.
- b. Temporary Stormwater Reroute Plan
  - i. Contractor shall be responsible for sizing and designing a temporary stormwater reroute system including necessary sumps, pumps, hoses, connections, tanks, temporary plugs and other items necessary to convey all existing upstream tributary area stormwater flows through or around the construction zone for the duration of work that interrupts existing stormwater conveyance systems.
  - ii. The temporary stormwater reroute system design shall address the following:
3. Provide pump size calculations, conveyance pipe sizes, materials and identify intercept/discharge locations.
  - a. Submit specifications for all pumps and standby pumps.
  - b. The Contractor shall develop temporary pipe plugging methods to control all reroute flows.
  - c. Contact name, mobile phone, fax, e-mail and address information for the personnel managing the site reroute system.

- d. The Contractor shall provide clear plans for access, plugging, repair and backfill of existing pipes at reroute/discharge locations that do not have catch basin access.
- 4. Materials to be submitted for each part of the CEWMP shall include the following:
  - a. Oil Absorbent Pads
  - b. Plastic Covering
  - c. Catch Basin Protection
  - d. Temporary Piping and/or Pumps
  - e. Storage Tanks/Treatment
  - f. Temporary Sediment Barrier
  - g. Temporary Turbidity Curtain
  - h. CESCL Certification Cards
  - i. CESCL Qualifications
- D. Inspection/monitoring daily reports for TESC and groundwater dewatering.
- E. Submit discharge monitoring reports to Ecology in accordance with the CSGP and associated Administrative Order.
- F. The Contractor shall submit notifications of deliveries, and schedule of sweeping and dust control activities a minimum of 48-hours prior to the activity.

#### **1.06 ADMINISTRATIVE REQUIREMENTS**

- A. The provisions of this section shall apply to the Contractor, subcontractors at all tiers, suppliers and all others who may have access to the Work Area by way of the Contractor's activities.
- B. Failure to install, maintain and/or remove BMPs shown on the Drawings, in the approved CEWMP and specified herein or by order of the City or failure to conduct project operations, in accordance with the requirements of this section will result in the suspension of the Contractor's operations by the City.
- C. The Contractor shall be solely responsible for any damages, fines, levies or judgments incurred as a result of Contractor, subcontractor or supplier negligence in complying with the requirements of this section. Resulting costs will be deducted from payment, including any time and material costs incurred by the City.
- D. The Contractor shall be solely responsible for any schedule impacts from damages, fines, levies, judgments or stop work orders incurred as a result of Contractor, subcontractor or supplier negligence in complying with the requirements of this section. The project schedule will not be changed to accommodate lost time due to incurred delays.

- E. Contractor shall not clear, demolish, or perform any work after NOTICE TO PROCEED, until the following has been installed to contain each Work Area per the project Drawings, the approved CEWMP, or as directed by the City:
  1. The Contractor shall mark a Work Area barrier/fence perimeter for the City to review and approve, prior to the construction of a Work Area perimeter.
  2. All construction entrances shall be paved or stabilized. If any visible sediment is tracked off-site, contractor shall utilize sweepers (capable of sweeping and vacuuming).
  3. Catch basin inserts shall be installed in all catch basins that receive drainage from the Work Area, including those catch basins within 100 feet of the Work Area.
  4. Install turbidity curtain before starting in-water work.
  5. Contractor shall have extra materials on hand in quantities sufficient to cover all bare soil, divert all flows, contain all sediments, and prevent turbid discharge from the site during all stages of construction. These materials include, but are not limited to the following:
    - a. Reinforced 6 mil plastic sheeting
    - b. Sandbags, filled
    - c. Inlet protection material
  6. Turbidity curtain
- F. A CSGP from Ecology is required for this project. The City has obtained coverage under Permit Number WAR315326 / Administrative Order Number 24547. The selected Contractor shall follow the requirements of the CSGP. For informational purposes, the Ecology form can be found at: <https://fortress.wa.gov/ecy/publications/SummaryPages/ecy02087a.html>
  1. The City will provide to the Contractor a copy of the required CSGP coverage transfer form for completion prior to the pre-construction conference.
  2. The Contractor shall comply with all CSGP requirements, and hold the City harmless for any work-related liability incurred under this permit obtained to perform work under this Contract.
  3. An electronic copy of the CSGP is located at:  
<https://apps.ecology.wa.gov/paris/DownloadDocument.aspx?Id=348923>
  4. Contractors shall monitor pollutants and implement any controls as identified in the CSGP at all discharge locations.
  5. Contractor shall be responsible for permitting and reporting requirements including monthly Discharge Monitoring Report (DMR). Contractor shall provide digital copies of the DMR to the City.

## 1.07 AUTHORITY OF CITY



- A. The City has the authority to limit the surface area of erodible earth material exposed by clearing operations and to direct the Contractor to provide immediate permanent or temporary pollution control measures to prevent contamination of adjacent watercourses or other areas of water impoundment.
- B. In the event that temporary erosion and pollution control measures are required due to the Contractor's negligence, carelessness or failure to install permanent controls as a part of the work as scheduled or are ordered by the City, such work shall be performed by the Contractor at their own expense.
- C. In the event that areas adjacent to the Work Area are suffering degradation due to erosion, sediment deposit, water flows or other causes, the City may stop construction activities until the situation is rectified.
- D. In the event that the Contractor discharges (TESC stormwater) into a receiving water body as defined by the City or Design Professional, without prior approval of the City, then all construction activities shall be stopped by the City. Additional training shall be required by Contractor staff and may require that all parties involved in the unapproved discharge be removed from the project for a time as determined by the City. The City shall require the Contractor to send additional staff to successfully complete CESCL training before construction activities may continue.
- E. The project schedule will not be changed to accommodate the time lost due to work stoppage. All costs associated with work stoppages, mitigation of the event and/or training shall be paid by the Contractor.

## **PART 2 PRODUCTS**

### **2.01 GENERAL**

- A. All products used to construct selected BMPs by the Contractor shall be suitable for such use and submitted to the Design Professional for approval.

### **2.02 OIL ABSORBENT PADS**

- A. Oil absorbent pads shall be made of white, 100% polypropylene fabric that absorbs oil-based fluids and repels water-based fluids. Each pad shall be a minimum of 15x19 inches in size and absorb no less than 50 ounces of oil-based fluids.

### **2.03 TEMPORARY CURB**

- A. Temporary curb shall be sandbags as directed by the City.

### **2.04 TEMPORARY FENCING AND BARRIER PROTECTION**

- A. Temporary construction fence shall be hauled and placed around the Work Areas and around all site features to be protected in place as indicated on the Drawings.

**2.05 FILTER FABRIC FENCE AND TEMPORARY SEDIMENT BARRIER**

- A. Geotextile material for filter fabric fence and temporary sediment barriers shall meet the requirements of WSDOT Specification 9-33 (Table 6). For filter fabric fences, geotextile material shall be attached to the construction fence and fence posts using wire rings where dimensions, location, and spacing shall be as shown on the Drawings or as directed by the Owner's Representative. For temporary sediment barriers, geotextile fabric shall completely encase the barrier and prevent material within barrier from spilling out and shall conform to Drawings. Temporary sediment barriers' dimensions, location, and spacing shall be as shown on the Drawings or as directed by the Owner's Representative.

**2.06 CATCH BASIN INLET PROTECTION**

- A. Catch basin inlet protection shall be designed and installed for the purpose of limiting sediment from entering the storm drain system. Inlet protection shall:
  - 1. Be constructed of non-woven geotextile fabric with sewn seams.
  - 2. Contain a built-in lifting strap.
  - 3. Have a built-in, high flow bypass.
  - 4. Be sized such that all water draining to the catch basin flows into the insert and does not flow directly into the storm drain pipe and shall be replaced as needed and required by the City.

**2.07 STABILIZED CONSTRUCTION ENTRANCE**

- A. Contractor shall install and maintain the stabilized construction entrance on site for the duration of the project as indicated in the Drawings.

**2.08 PLASTIC SHEETING**

- A. Plastic sheeting shall be reinforced and a minimum of 6-mil thick.
- B. Sandbags shall be used to secure the plastic sheeting in place.

**2.09 TEMPORARY PIPE PLUG**

- A. Temporary plugs used in pipes or structures, intended for demolition, shall be controlled density fill (CDF), as specified in **Section 31 00 00 EARTHWORK**.
- B. Temporary pipe plug installation in pipe/structures to remain, shall be with the use of a mechanical secured plug.
- C. See paragraph 3.03R in this section for additional plug requirements.

**2.10 WATER MANAGEMENT STORAGE TANK/TREATMENT**

- A. The Contractor shall determine the number, size, and storage necessary to address stormwater re-route systems, and construction surface runoff flows per SWMMWW. The Contractor shall provide a

minimum of one (1) water management storage tank with baffles for each Work Area that shall be located on-site to provide for additional storage volume and/or treatment volume for settlement.

- B. The storage tank shall be a fixed axle weir tank with a minimum 21,000-gallon capacity located in the Work Area. At the Contractor's option, the tank may be a truck mounted tank system with a minimum 21,000-gallon capacity.
- C. Temporary pipes, hoses, connections, pumps, and appurtenances shall be available and serviceable in each Work Area.
- D. The Contractor shall design TESC and dewatering systems to meet the discharge requirements outlined in the CSGP and in paragraphs 3.04 and 3.05 of this section.
  - 1. The Dewatering Treatment Plan shall be submitted for review and approval from the Engineer and Ecology. Monitoring and reporting will be required to document compliance with the CSGP and associated Administrative Order discharge limits.

## **2.11 TURBIDITY CURTAIN**

- A. A temporary turbidity curtain with a 4- to 6-foot debris curtain shall be installed to capture floating surface debris. The floating boom shall be equipped with absorbent pads to contain any oil sheens.

## **2.12 TEMPORARY CONSTRUCTION FENCE**

- A. Contractor shall install and maintain the temporary construction fence on site for the duration of the project as indicated in the Drawings.
- B. Maintain and repair the temporary fence as necessary for the duration of the project. The Contractor shall be responsible for replacing damaged temporary fence panels and/or parts.

## **PART 3 EXECUTION**

### **3.01 GENERAL**

- A. In the event of conflict between these requirements and pollution control laws, rules, or regulations of other Federal, State or Local agencies, the more restrictive laws, rules, or regulations shall apply.
- B. The CEWMP shall specifically phase, adjust, improve, and incorporate the CEWMP requirements into the Contractor's specific schedule and plan for accomplishing the Work. The CEWMP shall be modified as changes are made to improve, upgrade, and repair BMPs used by the Contractor and as the Work progresses.
- C. For any Work outside the Project Work Area Limits, the Contractor shall implement TESC and WQMPP BMPs.
- D. The Contractor shall be wholly responsible for control of water and debris onto and exiting the construction site, Work Areas and/or staging areas, including TESC, stormwater, groundwater,

temporary reroute and process water. Temporary stormwater reroute from offsite shall be intercepted and conveyed around or through the project and shall not be combined with onsite construction stormwater.

- E. Modifications to project hydraulic conveyances and TESC plan sheets shall be stamped by a Professional Engineer (P.E.) licensed by the State of Washington. All other changes to the CEWMP shall be signed by the CESCL.

### **3.02 CONTRACTOR PERSONNEL**

- A. The Contractor shall designate sufficient employees as the responsible representatives in charge of erosion and sedimentation control. These employees' responsibilities will be the oversight of all water and air quality issues. They shall have the authority to affect changes necessary to comply with applicable standards. One of these designated employees shall be onsite at all times when any work activity is taking place.
- B. Certified Erosion and Sediment Control Lead (CESCL)
  - 1. At minimum, one of the Contractor's designated employees responsible for erosion and sedimentation control, as discussed above, shall be the CESCL.
  - 2. The Contractor's CESCL shall have authority to direct all Contractor personnel and subcontractor personnel.
  - 3. The Contractor's CESCL shall have authority to act on behalf of the Contractor and shall be available, on call, 24 hours per day throughout the period of construction.
- C. CESCL Qualification Requirements
  - 1. The Contractor's CESCL shall be qualified in the preparation of erosion and sediment control plans, in the installation, inspection, monitoring, maintenance of BMP's, and documentation required for NPDES permits as well as sensitive resource identification, water treatment, and restoration and stabilization of unstable slopes, shorelines, stream banks, and wetlands.
  - 2. Qualifications of the CESCL shall be as follows:
    - a. Have successfully completed CESCL training given by an Ecology approved provider, and have five years of experience in construction site erosion and sediment control regulatory requirements and BMPs, erosion and sediment control plan development, and stormwater/water quality monitoring, or
    - b. Currently certified as a Certified Professional in Erosion and Sediment Control (CPESC) offered by CPESC, Inc. ([www.cpesc.org](http://www.cpesc.org)) and have one year experience in the state of Washington for construction site erosion and sediment control regulatory requirements and BMPs, erosion and sediment control plan development and stormwater monitoring.

3. The Contractor's CESCL shall also have done the following:
  - a. Coordinated, developed, and implemented erosion and sediment control plans for NPDES permit compliance in the State of Washington.
  - b. Completed at least two erosion and sediment control plans for earthwork projects.
  - c. Developed phased construction work schedules addressing all ground disturbing activities.
  - d. Designed proper temporary and permanent erosion and sediment control measures (BMPs) during clearing, new road construction, existing road improvement, and for emergency situations.
  - e. Designed plans for dust abatement, embankment stabilization and restoration, and protection measures for in-water and overwater work.
  - f. The Contractor shall submit for approval all documentation listed above necessary to prove the Contractor's CESCL qualifications, including but not limited to resumes, certificates, degrees, recommendation letters, and plan examples.

D. The Contractor's CESCL's duties and responsibilities shall include:

1. Maintaining the permit file on site at all times which includes the TESC Plan, the Stormwater Pollution Prevention Plan (SWPPP), and any associated permits and plans.
2. Directing BMP installation, inspection, maintenance, modification, and removal.
3. Availability 24 hours per day, 7 days per week by telephone.
4. Updating all drawings with changes made to the TESC Plan.
5. Keeping daily logs.
6. Immediately notify the City should any point be identified where storm water runoff potentially leaves the Work Area, is collected in a surface water conveyance system (i.e., road ditch, storm sewer) and enters receiving waters of the State.
7. If water sheet flows from the Work Area, identify the point at which it becomes concentrated in a collection system.
8. Inspect TESC Plan requirements including BMPs as required to ensure adequacy; facilitate, participate in, and take corrective actions resulting from inspections performed by outside agencies and the City.
9. Setup and maintain a construction stormwater discharge monitoring plan that includes monitoring locations and procedures. At a minimum, the plan will include monitoring points everywhere construction stormwater discharges from the project or as directed by the City.

E. Erosion and Sediment Control Inspectors

1. In addition to the Contractor's CESCL, the Contractor shall designate sufficient employees as Erosion and Sediment Control Inspectors who will be responsible for all erosion and sediment control, water quality, fugitive dust and other environmental compliance as directed by the CESCL. At a minimum, the Contractor's superintendent, foreman, and lead persons shall be designated as Erosion and Sediment Control Inspectors. On matters concerning erosion control, the Erosion and Sediment Control Inspectors shall report to the Contractor's CESCL.
2. The Erosion and Sediment Control Inspectors shall have successfully completed CESCL training given by a Washington State Department of Ecology approved provider.

**3.03 TEMPORARY EROSION AND SEDIMENT CONTROL REQUIREMENTS**

- A. To comply with and perform the required TESC work, the Contractor shall include, address, and execute the following as part of the TESC Plan:
1. Site Description and Drawings
    - a. Included in the TESC Plan shall be a written description of the construction site, including location of staging areas, stockpile areas (stockpiling if any, shall be minimized and contained within the established Work Areas), material storage areas, natural drainage systems within the Work Area and staging areas.
    - b. Drawings shall be included in the TESC Plan which shows the location of the construction site, including location of staging areas, stockpile areas (stockpiling if any, shall be minimized and contained within the established Work Areas), material storage areas, natural drainage systems within the Work Area and staging areas.
    - c. The TESC Plan Drawings shall show locations of BMPs during each phase of construction as identified by the Contractor in the Project Schedule.
- B. Schedule and Sequencing
1. The TESC Plan shall include:
    - a. Schedules for accomplishment of temporary and permanent erosion control work, which include as a minimum all specific work items as are applicable for clearing, demolition, and underground utilities.
    - b. Proposed method of erosion and dust control and a plan for disposal of waste materials.
    - c. Estimated removal date of all temporary BMPs.
    - d. Dates when construction activities temporarily or permanently cease on any portion of the site.
    - e. Dates when structural BMPs are initiated.

2. Erosion control work activities consistent with the TESC Plan shall be included in the Project Schedule for each Work Area and project activity as shown on the Drawings.

C. BMP Installation

1. The contractor will be responsible for BMP installation. The TESC Plan shall include installation instructions and details for each BMP used during the life of the Project.
2. To prepare or modify the TESC Plan, use BMPs from the Washington State Department of Ecology, Stormwater Management Manual for Western Washington, Vol. 2 (current edition). May be downloaded at: <http://www.ecy.wa.gov/programs/wq/stormwater/manual.html>
3. The Contractor shall certify that all BMP installers are trained in proper installation procedures.

D. BMP Maintenance

1. The Contractor will be responsible for BMP maintenance. The TESC Plan shall include a description of the maintenance and inspection procedures to be used for the life of the project.
2. BMPs shall be maintained for the life of the project, the completion of a work phase and/or until removed at the direction of the City.
3. BMPs shall be maintained during all work stoppages, suspension of work and all non-work periods.
4. BMPs shall be maintained and repaired as needed to assure continued performance of their intended function and in accordance with the approved TESC Plan.
5. Sediments removed during BMP maintenance shall be placed away from natural and constructed storm water conveyances and disposed at approved disposal facility.
6. All maintenance shall be completed within 24 hours of inspection.

E. BMP Inspection

1. In addition to the Contractor's CESCL weekly and rain event inspections, the Contractor shall visually inspect all TESC BMPs and good housekeeping practices daily.
2. Deficiencies identified during the inspection shall be corrected within 24 hours or as directed by the Owner's Representative.
3. Note repairs or improvements needed, if any, and notify the Contractor's CESCL or site project superintendent to implement improvements.
4. Observe runoff leaving the site during storms, checking for turbid water.
5. Recommend additional BMPs to implement, if needed, to address site-specific erosion control.
6. Inspect roadways surrounding the Work Areas for dirt tracking.

7. Inspect for dust.

F. Record keeping

1. The Contractor's CESCL will be responsible for recordkeeping. Reports summarizing the scope of inspections, the personnel conducting the inspection, the date(s) of the inspection, major observations relating to the implementation of the TESC Plan, and actions taken as a result of these inspections shall be prepared and retained as a part of the TESC Plan.
2. The TESC Plan shall include Ecology's Construction Stormwater inspection form which includes the following:
  - a. All BMPs to be inspected and monitored for all Work Areas and work activities identified in the schedule for the life of the contract.
  - b. Inspection time and date.
  - c. Weather information including current conditions, total rainfall since last inspection and rainfall in the 24 hours prior to the current inspection.
  - d. Locations of BMPs inspected.
  - e. Locations of BMPs that need maintenance and reasons why.
  - f. Locations of BMPs that failed to operate as designed or intended.
  - g. A description of stormwater discharged from the site including notes on the presence of suspended sediment, turbid water, discoloration, and/or petroleum sheen.
  - h. Any water quality monitoring performed during inspection.
  - i. General comments and notes, including a description of any BMP repairs, maintenance or installations made as a result of the inspection.
  - j. A statement that, in the judgment of the person conducting the site inspection, the site is either in compliance or out of compliance of the TESC Plan. If the site inspection indicates that the site is out of compliance, the inspection report shall include a summary of the remedial actions required to bring the site back into compliance, as well as a schedule of implementation. If the site inspection indicates that the site is out of compliance, the Contractor's CESCL shall notify the Owner's Representative immediately.
  - k. Name, title, and signature of the CESCL conducting site inspection and the following statement:  
"I certify that this report is true, accurate, and complete, to the best of my knowledge and belief."

G. BMP Removal



1. Temporary BMPs shall be removed upon permanent stabilization or as directed by the Owner's Representative.
2. Areas disturbed during removal of temporary BMPs shall be permanently stabilized.
3. After cleaning and removal of TESC BMPs, the drainage system shall not be used for temporary construction stormwater conveyance or storage.
4. Sediment removed shall be disposed of at an approved facility or as directed by the Owner's Representative.

#### H. Emergency Response

1. The TESC Plan shall contain information on how the Contractor shall control and respond to turbid water discharges, sediment movement, fugitive dust, and suspect sheen on discharged water or from pile removal activities. At a minimum, the Contractor's employees shall be responsible for, or first notice, fugitive discharges and shall take appropriate and immediate action to protect the Work Area, and the environment. Appropriate action includes but is not limited to the following:
  - a. Hazard Assessment - assess the source, extent, and quantity of the discharge.
  - b. Securement and Personal Protection - If the discharge cannot be safely and effectively controlled, then immediately notify the Contractor's CESCL and the Owner's Representative. If the discharge can be safely and effectively controlled, proceed immediately with action to protect the Work Area, private property, and the environment.
  - c. Containment and Elimination of Source - Contain the discharge with filter fabric fences, pipes, sandbags or a soil berm down slope from the affected area. Eliminate the source of the discharge by pumping turbid water to a controlled area, building berms, piping clean water away from the area or other means necessary.
  - d. Cleanup - when containment is complete, remove sediment, stabilize, dispose of contaminated water and prevent future discharge.
  - e. Notification - report all discharges immediately to the Owner's Representative.

#### I. Fugitive Dust Planning

1. The Contractor shall provide whatever means necessary to keep fugitive dust on site to an absolute minimum during working hours, non-working hours and any shut-down periods.
2. The Contractor's methods for fugitive dust control will be continuously monitored and if the methods are not controlling fugitive dust to the satisfaction of the City, the Contractor shall improve the methods or utilize new methods at no additional cost.

#### J. Utilities Planning

1. The TESC Plan shall identify when and how all utility work will be conducted so that water quality compliance is maintained. At a minimum, the Contractor shall:
  - a. Shut off valves and procure the means to shut off valves within 10 minutes of a water line break.
  - b. Cap utilities within 24 hours of being removed and cut.

K. Saw cutting

1. Saw cut slurry and cuttings shall be vacuumed during cutting operations.
2. Saw cut slurry and cuttings shall not remain on permanent concrete or asphalt pavement overnight.
3. Saw cut slurry and cuttings shall not drain to the Storm Drainage System, Industrial Waste System, or any other natural or constructed drainage conveyance.
4. Collected slurry and cuttings are the responsibility of the Contractor and shall be disposed of off-site in a manner that does not violate groundwater or surface water quality standards.

L. Soil and Construction Debris Stockpiles

1. Soil and construction debris shall be stockpiled within the work site or hauled off-site for disposal.
2. Stockpiles shall be minimized and shall be limited to small areas within the established Work Areas and limited to a maximum height of 12 feet. Stockpiles shall be covered with plastic and secured with sandbags from blowing wind. Stockpiles will be covered when not worked within:
  - a. 2 days, between October 1 and April 30; or
  - b. 7 days, between May 1 and September 30.
3. Plastic shall be a minimum thickness of 6 mil.
4. Covered stockpiles with damaged or missing sheeting shall be repaired or replaced immediately.
5. Materials to be stockpiled on pavement shall be placed on plastic and contained within an area that is bermed with a temporary curb and covered in a manner that prevents ponding water.
6. Clean storm water runoff from the plastic covering shall be directed away from bare soil using pipes, sandbags, or other temporary diversion devices.

M. Construction Vehicle Track-Off

1. Stabilized construction entrance shall be installed and maintained by Contractor. Additional quarry spalls shall be placed by Contractor as necessary to prevent vehicle track off.

2. No track-off of dirt or debris shall be allowed from the Work Area and loading zone onto the roadway. At no time shall mud, debris or visible sediment be allowed outside of the Work Area limits or on any City owned and public roads.
  - a. Before leaving the Work Area, all trucks and equipment shall be inspected for mud and debris. All mud and debris shall be removed by the Contractor from the work areas.
3. Debris shall be removed from pavement by vacuum sweeping and shoveling and transported to a controlled disposal area identified in the TESC Plan.
4. If the debris is contaminated by fuel, grease, metals, or other pollutants, it shall be disposed of in conformance with all applicable federal, state, and local waste disposal regulations.
5. Use of water to wash asphalt pavement shall be allowed only after sediment has been removed by vacuum sweeping and shoveling.
6. Power brooms shall not be utilized without prior approval by the Owner's Representative.
7. Contractor shall have sufficient working vacuum sweepers on site at all times when work is being performed. All sweepers shall have on-board water spray systems that shall be operating at all times.
8. Vacuum sweepers shall be dedicated to this project and shall not be utilized by any other contract nor be hired out to another Contractor.
9. At least one driver capable of operating the vacuum sweeper shall always be on site while work is commenced.
10. If, in the City's opinion, the Contractor does not adequately manage the tracking of sediment, the City may subcontract the control of sediment tracking at the Contractor's expense.

N. Catch Basin Protection

1. Catch basin inserts shall be installed in all catch basins that receive drainage from the Work Area or are within 100 feet of the Work Area.
2. Catch basin protection shall be installed in all storm drainage structures within the Work Area, as shown on the project drawings or as directed by the City.

O. Turbidity Curtain

The Contractor shall install a temporary turbidity curtain at the beginning of the project and maintain it throughout the duration of the in-water work. Turbidity curtains shall be installed as indicated in the Drawings or as instructed by the City. The Contractor shall adjust the turbidity curtain extents based on work activity. At a minimum the Contractor shall:

1. Place turbidity curtains at a sufficient distance from work performed to ensure materials are captured.
2. Anchor turbidity curtains to maintain capture area when strong winds or currents are present.
3. Provide personnel to monitor and maintain turbidity curtains for the duration of the work to prevent debris, silt, and other materials from migrating from the Work Area.
4. Debris collected in the turbidity curtain shall be collected and disposed as described in Section 02 41 13 – Site Demolition.
5. Provide additional absorbent booms and have them on hand for immediate deployment if needed for spill response.

P. Concrete Truck and Equipment Washing

1. Concrete truck chutes, concrete pumps, hand tools, screeds, floats, trowels, rollers and all other tools shall be washed out only into Ecology-approved covered steel containers or formed areas awaiting concrete or asphalt pavement.
2. All contained concrete waste shall be disposed of offsite in a manner that does not violate groundwater or surface water quality standards.
3. All water used for washing or impacted by placement of cementitious materials, is defined by Ecology as “process water” and shall be collected and disposed of per Ecology SWMMWW, Vol. 2 (current edition).

Q. Temporary Piping/Connections

1. The Contractor shall install temporary piping, catch basins, manholes, and/or connections to the existing storm drain system in locations shown on the Drawings and relocate as necessary to accommodate Contractor activities. At the completion of the Work, the temporary piping shall be removed and all temporary connections or modifications shall be repaired, modified, removed, or plugged to return the conveyance system to an enclosed operational system free of debris, voids, breaks, plugs, or other items.

R. Temporary Pipe Plugging

1. The locations of piping to be temporarily plugged are indicated on the Drawings. Additional plugs may be necessary to accommodate the Contractor’s activities and shall be the responsibility of the Contractor to adjust the temporary plugs and temporary stormwater reroute system as necessary to maintain reroute flows around the Work Areas and prevent seawater or stormwater from discharging into the Work Area. At the completion of the Work, the temporary plugs shall be removed.

### 3.04 TESC AND DEWATERING DISCHARGE AND MONITORING REQUIREMENTS

- A. The Contractor shall develop TESC systems that meet the following discharge criteria:
  - 1. All stormwater discharges from the project areas which have not come into contact with site soils can be routed to the storm drainage system following treatment to meet the CSGP limits. Stormwater discharge locations are indicated on the Drawings.
- B. Groundwater and water pumped out of trenches or water which has come into contact with site soils shall be treated for water quality such that it meets the following criteria:
  - 1. All groundwater discharged to the storm drain shall require testing, monitoring, and treatment according to the CSGP and specifications herein. Water must meet the following criteria per the CSGP:
    - a. Turbidity: < 25 NTUs according to analytical method SM2130 or a calibrated turbidity meter.
    - b. No visible sheen or discoloration.
    - c. pH: between 6.5 to 8.5 Standard Units.
  - 2. Discharges are subject to additional criteria of the CSGP. Contractor shall carefully examine the CSGP to determine any additional discharge requirement.
- C. Monitoring and Additional Measures
  - 1. The Contractor shall comply with all treatment and testing conditions outlined in the CSGP and associated Administrative Order.
  - 2. The Contractor shall capture, contain, and treat all contaminated dewatering water or contaminated stormwater (stormwater that has come into contact with contaminated soil) prior to discharge. The treatment system must have enough capacity to hold the treated dewatering water or stormwater until it has been tested to determine if any of the Indicator Levels listed in the CSGP have been exceeded. No dewatering water or stormwater may be discharged before it has been tested for these parameters.
  - 3. Once the effectiveness of the treatment system has been determined, the Contractor may revert to a flow-through treatment system after a minimum of two sampling and testing events and upon written approval from Ecology. Until the effectiveness of the treatment system has been approved by Ecology the Contractor shall batch treat and test all contaminated water.
  - 4. The Contractor shall test treated water weekly for parameters listed in the CSGP while utilizing a flow-through treatment system. If at any time discharge criteria are exceeded, the Contractor must cease discharge and must treat and re-test to demonstrate compliance with the CSGP and the associated Administrative Order prior to discharge.
  - 5. Any discharge of pollutants to the discharge point that is greater than the criteria specified in the CSGP must be immediately reported to Ecology.

6. All sampling data for the parameters identified in the CSGP and its associated Administrative Order must be reported monthly to Ecology on Discharge Monitoring Reports (DMRs) electronically using Ecology's WQWebDMR.

### **3.05 CONSTRUCTION DEWATERING SYSTEM**

#### **A. Dewatering Performance Requirements:**

1. Dewatering shall be performed to lower and maintain groundwater levels at least 2 feet, but no greater than 4 feet, below the bottom of excavation zones and structure foundations until backfilled and stabilized for buoyancy. See Section 31 23 19 – Dewatering.
2. All dewatering operations shall be adequate to assure the integrity of the new and existing infrastructure and shall be the responsibility of the Contractor.
3. It shall be the sole responsibility of the Contractor to control the rate and effect of the dewatering operations in such a manner as to avoid all objectionable settlement and subsidence.
4. The Contractor shall at the direction of the Engineer revise the dewatering system to address field conditions.
5. Contractor shall coordinate dewatering system design with their selected shoring systems.

#### **B. Dewatering Well Construction Requirements: If wells are used to minimize turbidity and sand is generated during dewatering, then the dewatering wells shall be constructed using the following standards.**

1. The Contractor shall provide gravel/sand pack filter material consisting of clean, rounded, washed select silica gravel or sand free from silt, clay and other deleterious material.
2. The Contractor shall design and construct the gravel/sand pack to maximize the flow of water from the formation into the dewatering wells to minimize the amount of fine-grained material removed from the formation.
3. The Contractor shall alter the sizes of the gravel/sand pack material for each installation as necessary in accordance with the grain-size distribution of the materials encountered during installation of the dewatering wells.
4. The Contractor shall furnish sufficient gravel/sand for initial gravel packing of the dewatering well and such additional gravel as may be required during development.
5. The Contractor shall furnish to the Design Professional a certificate of gravel/sand pack material quality and gradation prior to delivery.
6. Screens, casing and riser pipes for dewatering wells shall be capable of lasting and performing their intended function throughout the duration of the project.

7. The Contractor shall design dewatering well screens to minimize entrance velocity, maximize flow to the well and prevent entry of the gravel/filter pack into the well screen and casing.
8. Screens shall be factory slotted and sized appropriately for the gravel pack or formation to prevent the removal of fines from the formation.
9. Centralizers shall be placed both at the bottom of the dewatering well screen section and one foot above the top of the screen section in each well.
10. The Contractor shall install a surface seal for each well in accordance with WAC 173-160. The annular space shall be filled with bentonite (slurry or chips), cement grout or neat cement. Chips shall be hydrated when installed above the groundwater level. The Contractor shall obtain any variances to WAC 173-160 required to employ the well designs the Contractor considers necessary for proper performance of the dewatering systems.
11. Develop all wells after installation to remove all fines from drilling and installation. All development water and groundwater shall be treated according to the requirements in paragraph 3.05 in this section.

### **3.06 TEMPORARY STORMWATER REROUTE REQUIREMENTS**

- A. Contractor shall establish a temporary stormwater reroute system to convey upstream drainage around the Work Area to existing downstream locations, as necessary to manage the rerouted stormwater from the existing conveyance system.
  1. The Contractor shall be responsible for sizing the stormwater reroute system and providing sumps, pumps, hoses, connections, tanks, and other items necessary to convey all stormwater flows as shown on the Drawings.
  2. The Contractor shall size the bypass system to avoid any upstream flooding or inundation of the terminal and Work Area. The Contractor shall provide all pumps and/or storage/detention tanks as necessary to manage rerouted stormwater.
  3. A minimum of one (1) standby pump shall be provided.
- B. Discharge of the temporary stormwater reroute will not be subject to the monitoring requirements in paragraph 3.04 of this section. Rerouted stormwater from upstream tributary areas shall not be co-mingled with TESC water, unless it is after the selected monitoring locations for those discharges as described in paragraph 3.04 of this section.
- C. The Contractor shall check daily weather reports and be prepared for storm events. The Contractor shall visually inspect the temporary stormwater reroute system to ensure the system is in good working condition and ready for storm events.

- D. The temporary stormwater reroute system may be removed before the stormwater treatment system is operational. Coordinate with the Design Professional to determine when to remove temporary reroute. Contractor shall prevent upstream stormwater from flooding the work zones or hindering work during construction.

**END OF SECTION**



**01 60 00 PRODUCT REQUIREMENTS****PART 1 GENERAL****1.01 RELATED DOCUMENTS**

- A. [00 31 26 ASBESTOS AND LEAD CONTAINING MATERIALS CERTIFICATION FORM](#) for hazmat reporting requirements.
- B. [01 23 00 ALTERNATES](#) for products selected under an Alternate.
- C. [01 25 00 SUBSTITUTION PROCEDURES](#) for procedures and requirements related to Product Substitutions.
- D. [01 42 00 REFERENCE STANDARDS](#) for applicable industry standards for products specified.
- E. [01 77 00 CLOSEOUT PROCEDURES](#) for submitting warranties for contract closeout.
- F. Divisions **02 - 35** for specific requirements for warranties on products and installations specified to be warranted.

**1.02 SUMMARY**

- A. This Section includes the following administrative and procedural requirements: selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.

**1.03 DEFINITIONS**

- A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
- B. Named Products: Items identified by manufacturer's product name, including make or model number or other designation, shown or listed in manufacturer's published product literature, that is current as of the date of the Contract Documents.
- C. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
- D. Comparable or "Approved Equal" Product: Product that is demonstrated and approved through submittal process, and submitted as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- E. "Foreign Products," as distinguished from "domestic products," are items substantially manufactured (50 percent or more of value) outside the United States and its possessions. Products produced or

supplied by entities substantially owned (more than 50 percent) by persons who are not citizens of, nor living within, the United States and its possessions are also considered to be foreign products.

- F. "Materials" are products substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
- G. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.
- H. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
- I. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.
- J. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to City.
- K. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for City.

#### **1.04 SUBMITTALS**

- A. Product List: Submit a list, in tabular form, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.
- B. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
- C. Form: Tabulate information for each product under the following column headings:
- D. Specification Section number and title.
- E. Generic name used in the Contract Documents.
- F. Proprietary name, model number, and similar designations.
- G. Manufacturer's name and address.
- H. Supplier's name and address.
- I. Installer's name and address.
- J. Projected delivery date or time span of delivery period.
- K. Identification of items that require early submittal approval for scheduled delivery date.

- L. Initial Submittal: Within thirty (30) calendar days after date of commencement of the Work, submit a digital copy of initial product list. Include a written explanation for omissions of data and for variations from Contract requirements.
- M. At Contractor's option, initial submittal may be limited to product selections and designations that must be established early in Contract period.
- N. Completed List: Within sixty (60) calendar days after date of commencement of the Work, submit a digital copy of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
- O. Design Professional's Action: Design Professional will respond in writing to Contractor within fifteen (15) calendar days of receipt of completed product list. Design Professional's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Design Professional's response, or lack of response, does not constitute a waiver of requirement that products comply with the Contract Documents.
- P. Long-Lead-Time Items:
- Q. Provide copies of purchase orders for long-lead-time items to the Design Professional with reasonable promptness after receipt of Notice to Proceed.
- R. Forward copies of acknowledgment, production and shipping schedules to Design Professional as they are received for all required items.
- S. Substitution Requests: Refer to 01 25 00 - Substitution Procedures for requirements and options.
- T. Basis-of-Design Product Specification Submittal: Comply with requirements in [01 25 00 SUBSTITUTION PROCEDURES](#). Show compliance with requirements.

## 1.05 QUALITY ASSURANCE

- A. Source Limitations: To the fullest extent possible, provide products of the same kind from a single source.
- B. When specified products are available only from sources that do not, or cannot, produce a quantity adequate to complete project requirements in a timely manner, consult with the Design Professional to determine the most important product qualities before proceeding. Qualities may include attributes, such as visual appearance, strength, durability, or compatibility. When a determination has been made, select products from sources producing products that possess these qualities, to the fullest extent possible.
- C. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

- D. Foreign Product Limitations: Except under one or more of the following conditions, provide domestic products, not foreign products, for inclusion in the Work:
- E. No available domestic product complies with the Contract Documents.
- F. Domestic products that comply with the Contract Documents are available only at prices or terms substantially higher than foreign products that comply with the Contract Documents.

#### **1.06 PRODUCT DELIVERY, STORAGE, AND HANDLING**

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
- B. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
- C. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
- D. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
- E. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
- F. Store products to allow for inspection and measurement of quantity or counting of units.
- G. Store materials in a manner that will not endanger the Project site.
- H. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
- I. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
- J. Protect stored products from damage.
- K. Storage: Provide a secure location and enclosure at Project site for storage of materials and equipment by City's construction forces. Coordinate location with Owner's Representative.

#### **1.07 PRODUCT WARRANTIES**

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.
- C. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
- D. Specified Form: Forms are included with the Specifications. Prepare a written document using appropriate form properly executed.
- E. Refer to Divisions **02 through 35** Sections for specific content requirements and particular requirements for submitting special warranties.
- F. Submittal Time: Comply with requirements in [01 77 00 CLOSEOUT PROCEDURES](#).

## **PART 2 PRODUCTS**

### **2.01 PRODUCT REQUIREMENTS**

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged, and unless otherwise indicated, that are new at time of installation.
  - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
  - 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
  - 3. City reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
  - 4. Where products are accompanied by the term "as selected," Design Professional will make selection.
  - 5. Where products are accompanied by the term "match sample," sample to be matched is Design Professional's.
  - 6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
  - 7. Or Approved Equal: Where products are specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," or "or approved substitute," comply with provisions of 01 25 00 - Substitution Procedures and with the provisions in "Comparable Products" to obtain approval for use of an unnamed product.
  - 8. "Similar to": Where the words "similar to" are used and followed by a manufacturer's name and product, model or type number, such manufacturer, product, model or type number shall be

considered as the standard of quality for the item or product work specified, in a general and technical sense not meaning “identical.

9. See also, the requirements of [01 25 00 SUBSTITUTION PROCEDURES](#) for requirements and procedures for product selections.

B. Additional Requirements for Materials and Equipment:

1. Shall conform to applicable specifications and standards.
2. Shall comply with size, make, type and quality specified or as specifically approved in writing by Design Professional and/or Owner's Representative.
3. Shall be asbestos, formaldehyde, and lead-free.
  - a. Submit Asbestos-Free and Lead-Free Certification on [00 31 26 ASBESTOS AND LEAD CONTAINING MATERIALS CERTIFICATION FORM](#).
4. Manufactured and Fabricated Products:
  - a. Design, fabricate, and assemble in accordance with first-class “Workmanship” as referenced in [00 72 13 GENERAL CONDITIONS](#).
    - i. Manufacture like parts of duplicate units to standard sizes and gauges; parts to be interchangeable.
    - ii. Two or more items of the same kind to be identical and by same manufacturer (whether furnished under one Section or more).
    - iii. Products shall be suitable for service conditions.
    - iv. Adhere to indicated equipment capacities, sizes, and dimensions unless variations are specifically approved in writing.
5. Do not use materials and equipment for other than designed or specified purposes and uses.

## 2.02 PRODUCT IDENTIFICATION

- A. Name Plates: Except as otherwise indicated for required approval labels, and operating data, do not permanently attach or imprint manufacturer’s or producer’s nameplates or trademarks on exposed surfaces of products which will be exposed to view either in occupied spaces or on exterior of the work.
  1. Labels: Locate required labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface which, in occupied spaces, is not conspicuous.

2. Equipment Nameplates: Provide permanent nameplate on each item of service-connected or power-operated equipment. Indicate manufacturer, product name, model number, serial number, capacity, speed, ratings and similar essential operating data. Locate nameplates on an easily accessed surface which, in occupied spaces, is not conspicuous.

## **2.03 PRODUCT SELECTION PROCEDURES**

- A. For Substitutions, refer to [01 25 00 SUBSTITUTION PROCEDURES](#) unless otherwise noted. Procedures for product selection include the following:
  1. Product: Where Specification paragraphs or subparagraphs titled "Product" name a single product and manufacturer, provide the product named.
  2. Products: Where Specification paragraphs or subparagraphs titled "Products" introduce a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
  3. Product Options: Where Specification paragraphs titled "Product Options" indicate that size, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide either the specific product or system indicated or a comparable product or system by another manufacturer. Substitutions will be considered only when the words "or equal", "or approved", or "or approved substitute" are used. In those cases, refer to Division 1 Section "Substitutions" for procedures and requirements.
  4. Available Products: Where Specification paragraphs or subparagraphs titled "Available Products" introduce a list of names of both products and manufacturers, provide one of the products listed or another product that complies with requirements. Comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.
  5. Basis-of-Design Products: Where Specification paragraphs or subparagraphs titled "Basis-of-Design Product[s]" are included and also introduce or refer to a list of manufacturers' names, provide either the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.
- C. By Manufacturer:
  1. Manufacturer/Source: Where Specification paragraphs or subparagraphs titled "Manufacturer" or "Source" name single manufacturers or sources, provide a product by the manufacturer or from the source named that complies with requirements.

2. Manufacturers: Where Specification paragraphs or subparagraphs titled "Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
3. Available Manufacturers: Where Specification paragraphs or subparagraphs titled "Available Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed or another manufacturer that complies with requirements. Comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product and manufacturer.

D. By Example:

1. Visual Matching Specification: Where Specifications require matching an established Sample, select a product (and manufacturer) that complies with requirements and matches Design Professional's sample. Design Professional's decision will be final on whether a proposed product matches satisfactorily.
  - a. If no product available within specified category matches satisfactorily and complies with other specified requirements, comply with provisions of the [01 25 00 SUBSTITUTION PROCEDURES](#) for selection of a matching product.

E. By Selection:

1. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product (and manufacturer) that complies with other specified requirements.
  - a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Design Professional will select color, pattern, or texture from manufacturer's product line that does not include premium items.
  - b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Design Professional will select color, pattern, or texture from manufacturer's product line that includes both standard and premium items.

## **2.04 COMPARABLE PRODUCTS**

- A. Where products or manufacturers are specified by name, submit the following, in addition to other required submittals, to obtain approval of an unnamed product, provided the product and manufacturer complies with the "Product Options" provisions of this Section:
  1. Evidence that the proposed product does not require extensive revisions to the Contract Documents that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.



2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of Design Professionals and Owner, if requested.
5. Samples, if requested.

## **2.05 PRODUCT SUBSTITUTIONS**

- A. Timing: Refer to [00 21 13 INSTRUCTIONS TO BIDDERS](#).
- B. Conditions: Refer to [01 25 00 SUBSTITUTION PROCEDURES](#).

## **PART 3 EXECUTION**

### **3.01 INSTALLATION OF PRODUCTS**

- A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated.
  1. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
    - a. Do not proceed with the work if associated pre-installation conference cannot be concluded successfully.
    - b. Instigate actions to resolve impediments to performance of the work, and reconvene conference at earliest date feasible.
- B. Installer's Inspection of Conditions:
  1. Require Installer of each major unit of work to inspect substrate to receive the work, and conditions under which the work will be performed, and to report (in writing to Contractor) unsatisfactory conditions.
  2. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.
- C. Contractor's Inspection: Inspect each item of material or equipment immediately prior to installation, and reject damaged and defective items.
- D. Manufacturer's Instructions:

1. When Contract Documents require installation of work to comply with Manufacturer's printed instructions, obtain and distribute instructions to concerned parties, including Design Professional, and field office, before starting that particular work.
2. Until project is complete, maintain at jobsite one (1) set of complete installation and maintenance instructions for materials and equipment.
3. Handle, install, connect, clean, condition and adjust products in accordance with Manufacturer's recommendations, directions and specified requirements.
4. Perform work in accordance with Manufacturer's instructions. Do not omit any preparatory step or installation procedure unless it is:
  - a. Verified with and accepted by Design Professional.
  - b. Specifically modified or exempted by Contract Documents.

E. Attachment & Connection Devices & Methods:

1. Provide attachment and connection devices and methods for securing work properly as it is installed; true to line and level, and within recognized industry tolerances if not otherwise indicated.
2. Allow for expansions and building movements.
3. Provide uniform joint widths in exposed work, organized for best possible visual effect. Refer questionable visual-effect choices to Design Professional for final decision.

F. Precautions:

1. Acclimate product to room conditions as required by standard specifications and/or as recommended by manufacturer.
2. Install work during conditions of temperature, humidity, exposure, forecasted weather, and status of project completion which will ensure best possible results for each unit of work, in coordination with entire work.
3. Isolate each unit of work from non-compatible work, as required to prevent deterioration.
4. Re-check measurements and dimensions of the work, as an integral step of starting each installation.
5. Coordinate enclosure (closing-in) of work with required inspections and tests, so as to avoid necessity of uncovering work for that purpose.

G. Mounting Heights: Except as otherwise indicated, mount individual units of work at industry recognized standard mounting heights, for applications indicated. See Standard Mounting Heights indicated in drawings. Refer questionable mounting height choices to Design Professional for final

decision. See the Drawings for Typical Mounting Heights, and Interior Elevations for specific mounting heights, plus other drawings and detail sections.

H. In-Place Protection:

1. General:

- a. During handling and installation of work at project site, clean and protect work -in -progress and adjoining work on a basis of perpetual maintenance.
- b. Apply suitable protective covering on newly installed work where reasonably required to ensure freedom from damage or deterioration at time of substantial completion; otherwise, clean and perform maintenance on newly installed work as frequently as necessary through remainder of construction period.
- c. Adjust and lubricate operable components to ensure operability without damaging effects. Contractor is responsible for function, condition and unblemished appearance of all work on Project, and any item or work judged defective by Design Professional shall be subject to replacement at no additional cost to City.

2. Limited Exposures of Work: To extent possible through reasonable control and protection methods, supervise performance of work in a manner and by means which will ensure that none of the work, whether completed or in progress, will be subjected to harmful, dangerous, damaging, or otherwise deleterious exposures during construction period.

I. Replacement: Components with damage affecting appearance, function or structural characteristics will not be accepted; repair and/or replace all such items on the Project as directed at no additional expense to City.

**END OF SECTION**

## **01 70 00 EXECUTION REQUIREMENTS**

### **PART 1 GENERAL**

#### **1.01 RELATED DOCUMENTS**

- A. [00 73 18 HEALTH AND SAFETY REQUIREMENTS](#) for hazmat and waste disposal requirements.
- B. [01 30 00 ADMINISTRATIVE REQUIREMENTS](#) for procedures for coordinating field engineering with other construction activities.
- C. [01 32 00 CONSTRUCTION PROGRESS SCHEDULE AND REPORTING](#)
- D. [01 33 00 SUBMITTAL PROCEDURES](#)
- E. [01 40 00 QUALITY REQUIREMENTS](#)
- F. [01 50 00 TEMPORARY FACILITIES AND CONTROLS](#)
- G. [01 73 29 CUTTING AND PATCHING](#) for procedural requirements for cutting and patching necessary for the installation or performance of other components of the Work.
- H. [01 74 23 FINAL CLEANING](#) for final cleaning requirements.
- I. [01 77 00 CLOSEOUT PROCEDURES](#) for submitting final property survey with Project Record Documents, recording of City-accepted deviations from indicated lines and levels.
- J. [01 78 39 PROJECT RECORD DOCUMENTS \(AS BUILTS AND RECORD SET\)](#)

#### **1.02 SUMMARY**

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Construction layout and control
  - 2. Field engineering and surveying
  - 3. General installation of products
  - 4. Coordination of City-installed products
  - 5. Progress cleaning
  - 6. Starting and adjusting
  - 7. Protection of installed construction
  - 8. Correction of the Work
  - 9. Utility verification
  - 10. General coordination provisions

### **1.03 COORDINATION OF EXISTING FACILITIES**

- A. Furnish information to local utility company that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. The Contractor is responsible for coordinating construction activities with all utilities, districts, and contractors prior to and throughout construction.
- C. In the event utilities are damaged during construction, temporary services and/or repairs must be made immediately to maintain continuity of services at the Contractor's sole expense.

### **1.04 SUBMITTALS**

- A. Qualification Data: For land surveyor to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of Design Professional and Owner, and other information specified.
- B. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.
- C. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials and/or contaminated soils, documenting the disposal of hazardous waste and contaminated soil, if needed.
- D. Certified Surveys: Submit one (1) digital copy signed by land surveyor.
- E. Final Property Survey: Submit one (1) digital copy showing the Work performed and record survey data.

### **1.05 QUALITY ASSURANCE**

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

## **PART 2 PRODUCTS**

(NOT USED)

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.

1. Before construction, verify the location and points of connection of utility services.
- B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.
  1. Verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, irrigation, and water-service piping, as appropriate.
- C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
  1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
    - a. Description of the Work
    - b. List of detrimental conditions, including substrates
    - c. List of unacceptable installation tolerances
    - d. Recommended corrections
  2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
  3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
  4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
  5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

### **3.02 FIELD MEASUREMENTS**

- A. Work from lines and levels established by the property survey. Establish benchmarks and markers to set lines and levels at each story of construction and elsewhere as needed to locate each element of the Project. Calculate and measure required dimensions within indicated or recognized tolerances. Do not scale Drawings to determine dimensions.
  1. Advise entities engaged in construction activities of marked lines and levels provided for their use.
  2. As construction proceeds, check every major element for line, level and plumb.

- B. Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Site Improvements: Locate and lay out site improvements, including pavements, stakes for grading, fill and topsoil placement, utility slopes, and invert elevations.
- D. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- E. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a Request for Interpretation (RFI). Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents. See [00 63 13 REQUEST FOR INTEPRETEATION FORM](#).

### **3.03 SURVEYING**

- A. Identification: City will identify existing benchmarks, control points, and property corners via their site survey, which is included in the drawings.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
  - 1. Do not change or relocate existing benchmarks or control points without prior written approval of Design Professional. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Design Professional before proceeding.
  - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
  - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
  - 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
  - 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

- D. Surveyor's Log: Maintain a surveyor's log of control and other survey work. Make this log legible and available for reference.
  - 1. Record deviations from required lines and levels, and advise the design professional when deviations that exceed indicated or recognized tolerances are detected. On Project Record Drawings, record deviations that are accepted and not corrected.
- E. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.
- F. Final Property Survey: Prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey. Survey shall be submitted in electronic format. Provide in BIM or AutoCAD software, unless approved otherwise.
  - 1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
  - 2. Show all sanitary and storm line inverts and other requirements as indicated in the civil drawings and specifications, and as required by the agencies having jurisdiction.
  - 3. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

### **3.04 CONSTRUCTION LAYOUT**

- A. Verification: Before proceeding to layout the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Design Professional and Owner's Representative promptly.
- B. General: Engage a land surveyor to layout the Work using accepted surveying practices.
- C. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
- D. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
- E. Inform installers of lines and levels to which they must comply.
- F. Check the location, level and plumb, of every major element as the Work progresses.
- G. Notify Design Professional and Owner's Representative when deviations from required lines and levels exceed allowable tolerances.



- H. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- I. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.
- J. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations. General Contractor is responsible for and shall confirm all layout, including subcontractor's work.
- K. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and measuring devices used. Make the log available for reference by Design Professional.

### **3.05 INSTALLATION**

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
  - 1. Make vertical work plumb and make horizontal work level.
  - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
  - 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
  - 4. Maintain minimum headroom clearance of eight (8) feet in spaces without a suspended ceiling.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
  - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Design Professional.

- 2. Allow for building movement, including thermal expansion and contraction.
- G. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- H. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

### **3.06 OWNER-INSTALLED PRODUCTS - IF APPLICABLE**

- A. Site Access: Provide access to Project site for City's construction forces.
- B. Coordination: Coordinate construction and operations of the Work with work performed by City's construction forces.
  - 1. Construction Schedule: Inform City of Contractor's preferred construction schedule for City's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify City if changes to schedule are required due to differences in actual construction progress.
  - 2. Preinstallation Conferences: Include City's construction forces at preinstallation conferences covering portions of the Work that are to receive City's work. Attend preinstallation conferences conducted by City's construction forces if portions of the Work depend on City's construction.

### **3.07 GENERAL COORDINATION PROVISIONS**

- A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Coordinate temporary enclosures with required inspections and tests to minimize the necessity of uncovering completed construction for that purpose.
- C. Work By Others
  - 1. The City, utility companies, and others may be working within the Project areas while the Work is in progress. If so, the Contractor shall schedule the Work in conjunction with these other organizations to minimize mutual interference.
  - 2. If any part of the Work under this Contract depends on the results of work by others, the Contractor shall inspect and report, prior to the Contractor beginning work, to the City's Representative, any apparent discrepancies or defects in such work of others that render it unsuitable for proper results. Failure of the Contractor to inspect and report constitutes an acceptance of the work of others as fit and proper, except as to latent defects which may develop in the work performed by others after commencement of the work by the Contractor.

### **3.08 PROCESS CLEANING**

- A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
  - 1. Refer to [00 73 18 HEALTH AND SAFETY REQUIREMENTS](#) for disposal of Hazardous and Toxic Material.
    - a. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
  - 2. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.
    - a. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  - 3. Do not hold materials more than seven (7) calendar days during normal weather or three (3) calendar days if the temperature is expected to rise above 80 deg F (27 deg C).
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
  - 1. Remove liquid spills promptly.
  - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Cutting and Patching: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.
  - 1. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

### **3.09 STARTING AND ADJUSTING EQUIPMENT**

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in [01 40 00 QUALITY REQUIREMENTS](#).

### **3.10 PROTECTION OF INSTALLED CONSTRUCTION**

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:
  - 1. Excessive static or dynamic loading
  - 2. Excessive internal or external pressures
  - 3. Excessively high or low temperatures
  - 4. Thermal shock
  - 5. Excessively high or low humidity
  - 6. Air contamination or pollution
  - 7. Water or ice
  - 8. Solvents

9. Chemicals
10. Light
11. Radiation
12. Puncture
13. Abrasion
14. Heavy traffic
15. Soiling, staining, and corrosion
16. Bacteria
17. Rodent and insect infestation
18. Combustion
19. Electrical current
20. High-speed operation
21. Improper lubrication
22. Unusual wear or other misuse
23. Contact between incompatible materials
24. Destructive testing
25. Misalignment
26. Excessive weathering
27. Unprotected storage
28. Improper shipping or handling
29. Theft
30. Vandalism

C. Comply with manufacturer's written instructions for temperature and relative humidity.

### **3.11 CORRECTION OF THE WORK**

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in [01 73 29 CUTTING AND PATCHING](#).
  1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

**END OF SECTION**

**01 71 23 SURVEY****PART 1 GENERAL****1.01 SUMMARY**

- A. Contractor survey requirements. All work shall be performed by a surveyor registered in the State of Washington.
- B. All elevations indicated on the Drawings refer to North American Vertical Datum of 1988.
- C. All northings and eastings indicated on the Drawings refer to North American Datum of 1983.

**1.02 SURVEY PROVIDED BY THE OWNER**

- A. The Owner will provide those and only those services listed below:
  - 1. Primary survey control points for use by the Contractor.
- B. All other survey work needed for construction is the sole responsibility of the Contractor.
- C. All surveys for the purposes of completing as-built Drawings are the responsibility of the Contractor.

**1.3 CONTRACTOR SURVEYS**

- A. The Contractor shall establish such additional lines, grades and controls as are needed for construction.
- B. All work performed shall be in conformance with the lines, grades and dimensions indicated on the Drawings. If a discrepancy is noted in the Drawings, it shall be immediately brought to the Design Professional's attention. Where tolerances are stated, the work performed shall be within those tolerances. The Design Professional will determine if the work conforms to such lines, grades and dimensions and his determination shall be final.
- C. The Contractor assumes full responsibility for detailed dimensions and elevations measured from primary control points.
- D. The Contractor shall provide all survey services to monitor temporary shoring and other items as indicated in **31 50 00 SHORING AND TRENCH SAFETY SYSTEMS**.
- E. The Contractor shall provide all survey and services to monitor ground settlement as indicated in **31 23 19 DEWATERING**.

**1.04 QUALITY ASSURANCE**

- A. Qualification of Worker: The survey crew shall be led by a Washington State Licensed Land Surveyor.

**1.05 REFERENCES**

- A. Washington State Department of Transportation (WSDOT) Standard Plans and Specifications for Road, Bridge and Municipal Construction and Amendments (current edition).

**PART 2 PRODUCTS**

(NOT USED)

**PART 3 EXECUTION**

(NOT USED)

**END OF SECTION**



## **01 73 29 CUTTING AND PATCHING**

### **PART 1 GENERAL**

#### **1.01 RELATED DOCUMENTS**

- A. **Divisions 02-35** for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
  - 1. Requirements in this Section apply to mechanical and electrical installations.

#### **1.02 SUMMARY**

- A. This Section includes procedural requirements for cutting and patching.

#### **1.03 DEFINITIONS**

- A. Cutting: Removal of existing construction necessary to permit installation or performance of other Work.
- B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

#### **1.04 SUBMITTALS**

- A. Cutting and Patching Proposal: Submit a proposal describing procedures at least ten (10) calendar days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
  - 1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
  - 2. Changes to Existing Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
  - 3. Products: List products to be used and firms or entities that will perform the Work.
  - 4. Dates: Indicate when cutting and patching will be performed.
  - 5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.
  - 6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.

7. Design Professional's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

#### **1.05 QUALITY ASSURANCE**

- A. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.
- B. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio. Including, but not limited to:
  1. Foundation construction
  2. Bearing and retaining walls
  3. Structural concrete
  4. Structural steel
  5. Lintels
  6. Primary steel framing
  7. Structural decking
  8. Stair systems
  9. Miscellaneous structural metals
  10. Exterior curtain wall construction
  11. Equipment supports
  12. Piping, ductwork, vessels, and equipment
  13. Fixed pier
  14. Timber piles and pile caps to remain
  15. Existing floating wood dock
- C. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Including, but not limited to:
  1. Primary operational systems and equipment
  2. Air or smoke barriers

3. Fire-protection systems
  4. Control systems
  5. Communication systems
  6. Conveying systems
  7. Electrical wiring systems
- D. Miscellaneous Elements: Do not cut and patch the following elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Including, but not limited to:
1. Water, moisture, or vapor barriers
  2. Membranes and flashings
  3. Exterior curtain-wall construction
  4. Equipment supports
  5. Piping, ductwork, vessels, and equipment
  6. Noise- and vibration-control elements and systems
- E. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Design Professional's opinion, reduce the project's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner. Including, but not limited to:
1. Retain original Installer or fabricator to cut and patch exposed Work listed below.
    - a. Processed concrete finishes
    - b. Masonry
    - c. Ornamental metal
    - d. Matched-veneer woodwork
    - e. Preformed metal panels
    - f. Roofing
    - g. Firestopping
    - h. Window wall system

- i. Finished wood flooring
- j. Wall covering
- k. HVAC enclosures, cabinets, or covers

#### **1.06 WARRANTY**

- A. Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void warranties.

### **PART 2 PRODUCTS**

#### **2.01 MATERIALS**

- A. General: Comply with requirements specified in other Sections of these Specifications.
- B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
  - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Examine surfaces to be cut and patched and conditions under which cutting, and patching are to be performed.
  - 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
  - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

#### **3.02 PREPARATION**

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

#### **3.03 PERFORMANCE**

- A. General: Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
  - 1. Comply with requirements of Quality Assurance herein.
  - 2. Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
  - 3. Remove and replace work judged by Design Professional to be cut-and-patched in a visually unsatisfactory manner.
- B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
  - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  - 2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  - 4. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.
  - 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  - 6. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
  - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
  - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
  - a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
- D. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.
- E. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

**END OF SECTION**

## **01 74 19 CONSTRUCTION WASTE MANAGEMENT**

### **PART 1 GENERAL**

#### **1.01 SUMMARY**

- A. This section includes construction waste management requirements.

#### **1.02 DEFINITIONS**

- A. Co-mingled or Off-site Separation: Collecting all material types into a single bin or mixed collection system and separating the waste materials into recyclable material types at an off-site facility.
- B. Construction, Demolition and Land-Clearing (CDL) Waste: Includes all non-hazardous solid wastes resulting from construction, alterations, repair, demolition, and land clearing. Includes material that is recycled, reused, salvaged or disposed as garbage. This also includes uncontaminated soils that are designated as geotechnically unsuitable or excess excavation.
- C. Garbage: Product or material typically considered to be trash or debris that is unable to be salvaged and reused, returned, or recycled.
- D. Hazardous/Dangerous Waste: As defined by Chapter 70.105.010 Revised Code of Washington and 40 Code of Federal Register 261 and by Washington Administrative Code 173-303.
- E. Non-Recoverable Materials: Includes wastes, such as contaminated soils, asbestos, and lead (Pb) paint that have special handling and landfill disposal requirements.
- F. Proper Disposal: As defined by the jurisdiction receiving the waste.
- G. Recyclable Materials: Products and materials that can be recovered and remanufactured into new products.
- H. Recycling: The process of sorting, cleaning, treating and reconstituting materials for the purpose of using the material in the manufacture of a new product. Can be conducted on-site (as in the grinding of concrete).
- I. Recycling Facility: An operation that is permitted to accept materials for the purpose of processing the materials into an altered form for the manufacture of a new product.
- J. Salvage for Reuse: Existing usable product or material that can be saved and reused in some manner on the project site or other projects off-site.
- K. Source-Separated Materials: Materials that are sorted at the site into separate containers for the purpose of reuse or recycling.
- L. Sources Separation: Sorting the recovered materials into specific material types with no, or a minimum amount of, contamination on site.

- M. Time-Based Separation: Collecting waste during each phase of construction or deconstruction that results in primarily one major type of recovered material. The material is removed before it becomes mixed with the material from the next phase of construction.

### **1.03 SUBMITTALS**

- A. Waste Management Plan
- B. Waste Management Final Report

### **1.04 PERFORMANCE GOALS**

- A. General: Divert CDL waste to the maximum extent practicable from the landfill by one or a combination of the following activities:
  - 1. Salvage
  - 2. Reuse
  - 3. Source separated CDL recycling
  - 4. Co-mingled CDL recycling
- B. CDL waste materials that can be salvaged, resold, reused or recycled, include, but are not limited to the following:
  - 1. Clean dimensional wood, pallet wood, plywood, OSB, and particleboard
  - 2. Asphalt
  - 3. Concrete and concrete masonry units
  - 4. Brick
  - 5. Ferrous and non-ferrous metals
  - 6. Cardboard packaging
  - 7. Field office waste paper, aluminum cans, glass, plastic, and cardboard
  - 8. Hazardous/Dangerous Wastes, contaminated soils and other hazardous materials such as paints, solvents, adhesives, batteries, and fluorescent light bulbs and ballasts shall be disposed of at applicable permitted facilities.

### **1.05 WASTE MANAGEMENT PLAN**

- A. Within fourteen (14) calendar days after receipt of the Notice to Proceed, or prior to any waste removal, whichever occurs first, the Contractor shall submit a digital copy of the Draft Waste Management Plan to the City a Waste Management Plan narrative in accordance with these specifications. The Waste Management Plan shall include the following:



1. Name of designated Recycling Coordinator
2. A list of waste materials that will be salvaged for reuse, recycled, and disposed
3. Identify waste handling methods to be used, including one or more of the following:
  - a. Method 1: Contractor or subcontractor(s) hauls recyclable materials to an accepted recycling facility
  - b. Method 2: Contracting with diversion/recycling hauler to haul recyclable material to an accepted recycling or material recovery facility
  - c. Method 3: Recyclable material reuse on-site
  - d. Identification of each recycling or material recovery facility to be utilized, including name, address and types of materials being recycled at each facility
  - e. Description of the method to be employed in collecting, and handling, waste materials
  - f. Description of methods to communicate Waste Management Plan to personnel and subcontractors

B. Review and Approval

1. The Draft Waste Management Plan will be reviewed by the City for comment and approval.
  - a. The plan is checked to make sure that it meets the stated WSSP Green Goals, plus all materials that may be economically recycled are listed.
  - b. The plan is checked to make sure all materials that may be economically recycled are listed.
    - i. The plan is also checked for the haulers, recyclers and disposal facilities, to include recycling, general waste and hazardous waste facilities.
    - ii. Plan review comments are made by the City. Once an acceptable response is received the plan is approved.
    - iii. Source reduction of waste on the job site should be an integral part of the Waste Management Plan.

C. Implementation

1. Waste Manager: The Contractor shall designate an on-site party (or parties) responsible for instructing workers, overseeing and documenting results of the Waste Management Plan for the Project. This can be the same person that deals with the WSSP requirements (WSSP Facilitator). The City will provide staff to assist in this training and to make periodic visits.
2. Distribution: The Contractor shall distribute copies of the Waste Management Plan to the Job-Site Supervisor, each Subcontractor, the City and the Design Professional.

3. Prior to the start of each party's work, the Contractor shall provide on-site instructions for appropriate separation, handling, and recycling of salvage and reuse, and return methods to be used by all parties.
4. Separation Facilities: The Contractor shall lay out and label a specific area to facilitate separation of materials for potential recycling, salvage, reuse and return. Recycling and waste bin areas are to be kept clean and clearly marked in order to avoid contamination of materials.

#### **1.06 WASTE MANAGEMENT FINAL REPORT**

- A. Submit the Waste Management Final Report that shall list the following for the project:
  1. A record of each waste material type and quantity recycled, reused, salvaged, or disposed from the Project. Include total quantity of waste material removed from the site and hauled to a landfill; and
  2. Percentage of total waste material generated that was recycled, reused, or salvaged.
- B. Quantities shall be reported by weight (tons) unless otherwise accepted by the Design Professional.
- C. Submit copies of manifests, weight tickets, recycling/disposal receipts or invoices, which validate the calculations or a signed certification of completeness and accuracy of the final quantities reported.

#### **1.07 QUALITY ASSURANCE**

- A. Regulatory Requirements: The Contractor shall maintain compliance with all applicable Federal, State, or Local laws that apply to Construction Waste Management and material salvage, reuse, recycling and disposal.
- B. Disposal Sites, Recyclers and Waste Materials Processors: All facilities utilized for management of any materials covered under this specification must maintain all necessary permits as required by federal, state and local jurisdictions.
- C. For a comprehensive list of recycling facilities in King County, and other Contractor resources, contact King County's Construction and Demolition Recycling Program:  
<http://your.kingcounty.gov/solidwaste/greenbuilding/construction-demolition.asp>

### **PART 2 PRODUCTS**

(NOT USED)

### **PART 3 EXECUTION**

#### **3.01 SOURCE-SEPARATED CDL RECYCLING**

- A. Provide individual containers for separate types of CDL waste to be recycled, clearly labeled with a list of acceptable and unacceptable materials.

#### **3.02 CO-MINGLED CDL RECYCLING**

- A. Provide containers for co-mingled CDL waste to be recycled, clearly labeled with a list of acceptable and unacceptable materials.

### **3.03 LANDFILL**

- A. Provide containers for CDL waste that is to be disposed of in a landfill clearly labeled as such.

### **3.04 REMOVAL OF CDL WASTE FROM PROJECT SITE**

- A. Transport CDL waste off Owner's property and legally dispose of them.

**END OF SECTION**

## **01 74 23 FINAL CLEANING**

### **PART 1 GENERAL**

#### **1.01 RELATED DOCUMENTS**

- A. [00 78 18 HEALTH AND SAFETY REQUIREMENTS](#) for additional hazmat and waste management requirements.
- B. [01 70 00 EXECUTION REQUIREMENTS](#) for progress cleaning of Project site.
- C. [01 77 00 CLOSEOUT PROCEDURES](#) for general project closeout requirements.
- D. **Divisions 02 - 35** for specific closeout and special cleaning requirements for products of those Sections.

#### **1.02 SUMMARY**

- A. This Section specifies administrative and procedural requirements for final cleaning at Substantial Completion.
- B. Environmental Requirements: Conduct cleaning and waste disposal operations in compliance with local laws and ordinances. Comply fully with federal and local environmental and anti-pollution regulations.
  - 1. Do not dispose of volatile wastes such as mineral spirits, oil or paint thinner in storm or sanitary drains.
  - 2. Burning or burying of debris, rubbish or other waste material on the premises is not permitted.
  - 3. Only use products that are environmentally safe and that will not cause or contribute to Indoor Air Quality (IAQ) problems when the facility is occupied.
- C. Should the Contractor fail in any of its duties described in this Section, the City may, at its sole discretion, have the Project cleaned thoroughly to its standards. The cost of this cleaning shall be deducted from the Contractor's Final Payment or retainage.

### **PART 2 PRODUCTS**

#### **2.01 MATERIALS**

- A. Cleaning Agents: Use cleaning materials and agents recommended by the manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property, or that might damage finished surfaces. Pay special attention to easily marred surfaces and reactive metals such as aluminum.

### **PART 3 EXECUTION**

#### **3.01 FINAL CLEANING**

- A. General: Provide final cleaning operations for all trades. Employ professional cleaners for final cleaning. Clean each surface or unit of Work to the condition expected from a first class institutional building cleaning and maintenance program. Comply with manufacturer's instructions.
- B. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion for the entire Project or a portion of the Project.
  - 1. Clean the Project site, yard, and grounds in areas disturbed by construction activities, including landscape development areas, of rubbish, waste materials, litter, and foreign substances.
  - 2. Sweep paved areas broom clean and power wash as required. Remove petro-chemical spills, stains and other foreign deposits. Rake grounds that are neither planted nor paved, to a smooth even-textured surface.
  - 3. Remove all plant labels and plant-related debris.
  - 4. Remove snow and ice to provide safe access to building.
  - 5. Remove tools, construction equipment, machinery and surplus material from the site.
  - 6. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films and similar foreign substances. Pay special attention to corners and other hard to clean areas. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
  - 7. Remove debris and surface dust from limited access spaces, including roofs, gutters, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
  - 8. Broom clean and shop vacuum concrete floors in unoccupied spaces.
  - 9. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
  - 10. Mop all exposed concrete and other hard surface flooring.
  - 11. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
  - 12. Clean ducts, blowers, and coils if units were operated without filters during construction.
  - 13. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
  - 14. Replace parts subject to unusual operating conditions.

15. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
  16. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
  17. Remove all visible labels that are not permanent labels and are not related to a product's fire, mechanical or electrical rating. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
  18. Touch-up and otherwise repair and restore marred exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored, or that already show evidence of repair or restoration.
  19. Wipe surfaces of equipment. Remove excess lubrication, paint, sealant, and mortar droppings and all other foreign substances.
  20. Use metal detector to locate all metal objects, nails, etc. that may pose a hazard. Sweep all non-hard surface areas that were within or adjacent to any construction area or over which any construction related traffic traveled.
  21. Leave the Project clean and ready for occupancy.
- C. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.
  - D. Removal of Protection: Unless requested otherwise by the City, remove temporary protection of facilities installed during construction to protect previously completed installation during the remainder of the construction period.
  - E. Compliances: Comply with governing regulations and safety standards for cleaning operations. Remove waste materials from the site and dispose of in a lawful manner.
  - F. Where extra materials of value remain after completion of associated construction such materials shall become the City's property. At the City's direction, relocate these materials on site.

**END OF SECTION**

**01 77 00 CLOSEOUT PROCEDURES****PART 1 GENERAL****1.01 RELATED DOCUMENTS**

- A. [00 62 76 PAYMENT APPLICATION FORM](#)
- B. [01 29 00 PAYMENT PROCEDURES](#) for requirements for Applications for Payment for Substantial and Final Completion.
- C. [01 32 00 CONSTRUCTION PROGRESS SCHEDULE AND REPORTING](#) for submitting Final Completion construction photographs and electronic files.
- D. [01 70 00 EXECUTION REQUIREMENTS](#) for progress cleaning of Project site.
- E. [01 74 23 FINAL CLEANING](#)
- F. [01 78 23 OPERATIONS AND MAINTENANCE DATA](#) for operation and maintenance manual requirements.
- G. [01 78 39 PROJECT RECORD DOCUMENTS \(AS BUILTS AND RECORD SET\)](#) for submitting Record Drawings, Record Specifications, and Record Product Data.
- H. [01 79 00 DEMONSTRATION AND TRAINING](#) requirements for instruction of City's personnel.
- I. **Divisions 02-35** for specific closeout and special cleaning requirements for products of those Sections.

**1.02 SUMMARY**

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Inspection procedures
  - 2. Instruction of City's personnel

**1.03 SUBSTANTIAL COMPLETION**

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
  - 1. Prepare a list of items to be completed and corrected (Contractor's punch list), the value of items on the list, and reasons why the Work is not complete.
  - 2. Advise City of pending insurance changeover requirements.
  - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.

4. Obtain and submit releases permitting City unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs (when required by other Sections), damage or settlement surveys, property surveys, and similar final record information.
  6. Deliver tools, spare parts, extra materials, and similar items to location designated by City. Label with manufacturer's name and model number where applicable.
  7. Make final changeover of permanent locks and deliver keys to City. Advise City's personnel of changeover in security provisions.
  8. Complete startup and testing of systems to assure correct operation and compliance with agency requirements to obtain a Certificate of Occupancy, when applicable.
  9. Submit test/adjust/balance records.
  10. Complete and submit Pre-Commissioning Checklist, when applicable.
  11. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
  12. Advise City of changeover in heat and other utilities.
  13. Submit changeover information related to City's occupancy, use, operation, and maintenance.
  14. Complete final cleaning requirements, including touchup painting.
  15. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. Substantial Completion Review: Upon completion of above "Preliminary Procedures" and submission of satisfactory proof thereof, submit a written request for review for Substantial Completion. On receipt of request, Design Professional will either proceed with review or notify Contractor of unfulfilled requirements. Design Professional will prepare the Certificate of Substantial Completion after review or will notify Contractor of items, either on Contractor's list or additional items identified by Design Professional, that must be completed or corrected before certificate will be issued.
1. Re-review: Request re-review when the Work identified in previous reviews as incomplete is completed or corrected.
  2. Results of completed review will form the basis of requirements for Final Completion.

#### **1.04 REQUEST FOR FINAL COMPLETION REVIEW**

- A. Preliminary Procedures: Before requesting final review for determining date of Final Completion, complete the following:



1. Submit a final Application for Payment according to [01 29 00 PAYMENT PROCEDURES](#).
  2. Submit certified copy of Design Professional's Substantial Completion review list of items to be completed or corrected (Design Professional's punch list). The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
  3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
  4. Submit pest-control final review report and warranty, if applicable.
  5. Complete and submit evidence of all Commissioning requirements, if applicable.
  6. Instruct City's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training recordings.
  7. Submit evidence of final hookup and acceptance from utility agencies.
- B. Request for Final Completion Review: Submit a written request for final review for acceptance. On receipt of request, Design Professional will either proceed with review or notify Contractor of unfulfilled requirements.
1. Submit a written request for final review at least ten (10) calendar days prior to anticipated date.
  2. Re-review: Request re-review when the Work identified in previous reviews as incomplete is completed or corrected.

#### **1.05 REVIEW FEES**

- A. Substantial Completion Review: The Design Professional or their consultant team will complete one project review of the Work to confirm substantial completion. Should it be necessary for the Design Professional or their consultant team to perform any additional reviews due to failure of Work to comply with substantial completion, the City will compensate the Design Professional for the additional reviews at the rate of \$230 per hour plus expenses with a minimum fee of \$230, and shall deduct the total sum paid to the Design Professional or their consultants from the Contractor's final payment in the form of a Change Order.
- B. Final Completion Review: The Design Professional or their consultant team will complete one final review of the Work to confirm Final Completion. Should it be necessary for the Design Professional or their consultant team to perform any additional reviews due to failure of Work to be fully complete (completion of all Substantial Completion Review items plus any other known contract Work,) the City will compensate the Design Professional for the additional reviews at the rate of \$230 per hour plus expenses with a minimum fee of \$230, and shall deduct the total sum paid to the Design Professional or their consultants from the Contractor's final payment in the form of a Change Order.

#### **1.06 CONTRACTOR'S LIST OF INCOMPLETE ITEMS (CONTRACTOR'S PUNCH LIST)**

- A. Preparation: Submit one (1) digital copy of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
  - 1. Organize list of spaces in sequential order.
  - 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
  - 3. Include the following information at the top of each page:
    - a. Project name
    - b. Date
    - c. Name of Design Professional
    - d. Name of Contractor
    - e. Page number

#### **1.07 CONTRACTOR'S CLOSEOUT SUBMITTALS**

- A. Preliminary Procedures: Before requesting certification of Final Completion and final payment, complete the following. Submit all of the following items together – no partial submittals will be accepted.
  - 1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.
    - a. An affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the work for which the City of property might in any way be responsible, have been paid or otherwise satisfied. (Use City of Mercer Island Release of Liens Form)
    - b. Submit Contractor's Affidavit of Release of Liens (City of Mercer Island Release of Liens Form): If any liens are filed and cause the City to employ the services of any attorneys, the cost of the services will be deducted from the retainage.
    - c. If any liens are filed and cause the City to employ the services of any Attorneys, the cost of the services will be deducted from the retainage.
    - d. Also refer to the requirements of the [00 72 13 GENERAL CONDITIONS](#).
    - e. Letter from Bonding Company addressed to City and submitted to Design Professional approving release of final payment and waiving submittal of final receipts as well as a statement confirming the extension of the Bond for the one-year guarantee period. Final receipts from all subcontractors and material and equipment suppliers shall be furnished to the

Design Professional by the Contractor if the Surety does not waive this requirement. Letters to be in substantially the following form:

- f. *Re: (Bond No.)(Name of Contractor)(Name of Project)To Whom it May Concern:The (Name of Bonding Company), Surety on the above named bond consents to payment of retained percentages and agrees to waive submittal of final receipts.It is also agreed that the final payment to the Contractor shall not relieve the Surety Company of any of its obligations and that the Bond is extended to include guarantees of workmanship and materials.(NAME OF BONDING COMPANY)By \_\_\_\_\_Attorney-in-Fact*
2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
3. Submit a copy of the Design Professional's final review list of ("punch list") items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, identifying the name and company of the individual who confirmed completion of each item, and date when confirmation inspection performed.
4. Submit consent of surety to final payment on AIA Form G707, or approved equivalent.
5. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
6. Submit warranties: As required by appropriate technical sections, and [01 78 36 WARRANTIES](#).
7. Washington State Department Labor & Industries Affidavit of Wages Paid (State Form 9843) approved by Department Labor & Industries for Contractor and all Subcontractors.
8. Submit approved Balancing Logs.
9. Submit certified Statement indicating asbestos containing material were not utilized or incorporated on the Project provided by Contractor under this contract.
  - a. Refer to [00 31 26 ASBESTOS AND LEAD CONTAINING MATERIALS CERTIFICATION FORM](#).
10. Certification that all surplus materials identified in Contract Document have been delivered to the City's designated representative. Attach list of items and receipts with signature by City's designated representative for all items.
11. Submit approved Record Documents.
12. Submit approved O & M Manuals.
13. Submit keys and keying schedule.
14. Submit evidence of completion of commissioning of designated building systems, if applicable.
15. Submit evidence of completion of City's training for all designated systems.
  - a. Refer to [00 72 13 GENERAL CONDITIONS](#) for additional requirements.

16. Evidence of Compliance with Requirements of governing Authorities.

- a. Certificate of Occupancy, if not submitted at time of Substantial Completion.
- b. (Note: Certificate of Occupancy is required to be submitted with Substantial Completion Request unless otherwise exempted by City in writing.)
- c. Certificates of Inspection
  - i. Mechanical Work
  - ii. Electrical Work
- d. Others as required by Regulatory Agencies.

17. Submit all other required close-out documents.

18. Submit evidence of delivery of extra stock materials to City. Provide a comprehensive list of all materials delivered, with the City's signature and date.

B. Substantial Completion:

- 1. Upon the Contractor's request for review of work for substantial completion, the Owner's Representative will review the Work and provide to Contractor a list of items found to be deficient. Contractor shall correct all items appearing on the punch list and notify the Owner's Representative in writing prior to the request for final review.

C. Final Acceptance (completion) Review: The Design Professional and their consultants will complete one final acceptance review of the Work to confirm completion.

- 1. Final review for acceptance shall be made at the completion of all Work.
  - a. There will be one (1) final review and not several scheduled in phases or prematurely.
  - b. Should it be necessary for the Design Professional or their consultants to perform any additional reviews due to failure of Work to be judged fully complete, the City will compensate the Design Professional for the additional reviews at the rate of \$230 per hour and shall deduct the total sum paid to the Design Professional or his consultants from the Contractor's final payment in the form of a change order.
- 2. Final payment (or bond) will not be issued until all Work and closeout procedures have been approved as complete by all applicable agencies. After review and notification, Contractor of construction that must be completed or correct Work before certificate will be issued.

**PART 2 PRODUCTS**

(NOT USED)

**PART 3 EXECUTION**

(NOT USED)

**END OF SECTION**

**01 78 23 OPERATIONS AND MAINTENANCE DATA****PART 1 GENERAL****1.01 RELATED DOCUMENTS**

- A. [01 33 00 SUBMITTAL PROCEDURES](#) for submitting copies of submittals for operation and maintenance manuals.
- B. [01 77 00 CLOSEOUT PROCEDURES](#) for submitting operation and maintenance manuals.
- C. [01 78 39 PROJECT RECORD DOCUMENTS \(AS BUILTS AND RECORD SET\)](#) for preparing Record Drawings for operation and maintenance manuals.
- D. **Divisions 02 - 35** for specific operation and maintenance manual requirements for products in those Sections.

**1.02 SUMMARY**

- A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
  - 1. Operation and maintenance documentation directory
  - 2. Emergency data
  - 3. Operation data for systems, subsystems, and equipment
  - 4. Maintenance data for the care and maintenance of products, materials, finishes, systems and equipment

**1.03 DEFINITIONS**

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

**1.04 SUBMITTALS**

- A. Initial Submittal: Submit one (1) draft copy of each manual at least fifteen (15) calendar days before requesting inspection for Substantial Completion. Include a complete operation and maintenance directory. Design Professional will mark whether general scope and content of manual are acceptable.
- B. Final Submittal: Submit one (1) electronic copy (PDF format) of each manual in final form at least fifteen (15) calendar days before Final Review. If necessary, Design Professional will return copy with comments within twenty-one (21) calendar days after Final Review.
  - 1. Correct or modify each manual to comply with Design Professional's comments and resubmit all copies.

**1.05 COORDINATION**

- A. Where operation and maintenance documentation include information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

**PART 2 PRODUCTS****2.01 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY**

- A. Organization: Include a section in the directory for each of the following:
  - 1. List of documents
  - 2. List of equipment
  - 3. List of fixtures
  - 4. List of systems
  - 5. Table of contents
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with the same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

**2.02 MANUALS, GENERAL**

- A. Organization: Unless otherwise indicated, organize manuals into sections following the specifications Table of Contents with subsections for each system and subsystem, and a separate subsection for each piece of equipment not part of a system. General Contractor to assemble all information into one or multiple volumes of binders with uniform appearance, consistent format and tabbing, with each volume embossed with project title and contents. Separately bound manuals from specialty subcontractors must be disassembled and bound into the General Contractor's manuals with formatting and tabbing as noted above. Each manual shall contain the following materials, in the order listed:
  - 1. Title page

2. Table of contents
  3. Manual contents
  4. Provide the sections and sub-sections in the following format, which generally follows the CSI Specification Division:
    - a. Division 01 - General Information: Generally including sub-sections for:
      - i. Title Page
      - ii. Table of Contents
      - iii. General Information
      - iv. General Contractor's Project Warranty(s)
      - v. General Contractor's Closeout Submittals
      - vi. Construction Photographs (if required)
      - vii. Other Submittals/Data: If not associated with Divisions 02 through 35.
  5. For Divisions 02 through 35, provide Sections following the Specifications Table of Contents, with each Section divided into subsections as follows:
    - a. Warranty(s)
    - b. Product Data/Project Submittals
    - c. Shop Drawings
    - d. Operation Data
    - e. Maintenance Data
    - f. Other information
  6. For Divisions 02-35, provide Sections and Subsections as described in this Section for Emergency Data, as applicable.
- B. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:
1. Subject matter included in manual
  2. Name and address of Project
  3. Name and address of City
  4. Date of submittal
  5. Name, address, and telephone number of Contractor



6. Name and address of Design Professional
  7. Cross-reference to related systems in other operation and maintenance manuals
- C. Table of Contents: List each Section Name and Number, each Subsection Name and Number, and all products included, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
1. If manuals require more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents as indicated above.
1. Binders: Heavy-duty, hinged, 3-ring, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (115-by-280-mm) paper. Provide with permanently labeled clear plastic cover and spine with embossed title and volume number on both.
    - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by Section. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
    - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.
  2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
  3. Supplementary Text: Prepared on 8-1/2-by-11-inch (115-by-280-mm), 20-lb/sq. ft. (75-g/sq. m) white bond paper.
  4. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
    - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
    - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.
    - c. Electronic Format: In addition to two hardcopy manuals, provide complete manuals in electronic PDF format. PDF files shall be organized into folders and sub-folders matching the tabs and sub-tabs of the hardcopy manuals. PDF folders shall be organized in such a way that the user may easily print entire manuals that will match the hard copy manuals provided.

**2.03 EMERGENCY DATA**

- A. Content: Organize data into Divisions 02-35, as applicable, including the following as major Sections:
  - 1. Type of emergency
  - 2. Emergency instructions
  - 3. Emergency procedures
- B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
  - 1. Fire
  - 2. Flood
  - 3. Gas leak
  - 4. Water leak
  - 5. Power failure
  - 6. Water outage
  - 7. System, subsystem, or equipment failure
  - 8. Chemical release or spill
- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of City's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
  - 1. Emergency Procedures: Include the following, as applicable:
    - a. Instructions on stopping
    - b. Shutdown instructions for each type of emergency
    - c. Operating instructions for conditions outside normal operating limits
    - d. Required sequences for electric or electronic systems
    - e. Special operating instructions and procedures

**2.04 OPERATION DATA**

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
  - 1. System, subsystem, and equipment descriptions

2. Performance and design criteria if Contractor has delegated design responsibility
3. Operating standards
4. Operating procedures
5. Operating logs
6. Wiring diagrams
7. Control diagrams
8. Piped system diagrams
9. Precautions against improper use
10. License requirements including inspection and renewal dates

B. Descriptions: Include the following:

1. Product name and model number
2. Manufacturer's name
3. Equipment identification with serial number of each component
4. Equipment function
5. Operating characteristics
6. Limiting conditions
7. Performance curves
8. Engineering data and tests
9. Complete nomenclature and number of replacement parts

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures
2. Equipment or system break-in procedures
3. Routine and normal operating instructions
4. Regulation and control procedures
5. Instructions on stopping
6. Normal shutdown instructions
7. Seasonal and weekend operating instructions

- 8. Required sequences for electric or electronic systems
- 9. Special operating instructions and procedures
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

## **2.05 PRODUCT MAINTENANCE DATA**

- A. Content: Organize data into a separate subsection for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
  - 1. Product Information: Include the following, as applicable:
    - a. Product name and model number
    - b. Manufacturer's name
    - c. Color, pattern, and texture
    - d. Material and chemical composition
    - e. Reordering information for specially manufactured products
- C. Maintenance Procedures: Include manufacturer's written recommendations and the following:
  - 1. Inspection procedures
  - 2. Types of cleaning agents to be used and methods of cleaning
  - 3. List of cleaning agents and methods of cleaning detrimental to product
  - 4. Schedule for routine cleaning and maintenance
  - 5. Repair instructions
- D. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- E. Warranties: Include copies of warranties and lists of circumstances and conditions that would affect validity of warranties.
  - 1. Include procedures to follow and required notifications for warranty claims.

**2.06 SYSTEMS AND EQUIPMENT MAINTENANCE DATA**

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in the manual, identified by product name and arranged to match manual's table of contents. For each product, list: name, address, and telephone number of installer or supplier and maintenance service agent, and cross-reference specification Section number and title in Project Manual.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
  - 1. Standard printed maintenance instructions and bulletins
  - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly
  - 3. Identification and nomenclature of parts and components
  - 4. List of items recommended to be stocked as spare parts
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
  - 1. Test and inspection instructions
  - 2. Troubleshooting guide
  - 3. Precautions against improper maintenance
  - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions
  - 5. Aligning, adjusting, and checking instructions
  - 6. Demonstration and training videotape, if available
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
  - 1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
  - 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
  - 1. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
  - 2. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
    - a. Include procedures to follow and required notifications for warranty claims.

### **PART 3 EXECUTION**

#### **3.01 MANUAL PREPARATION**

- A. Manual Organization: Prepare as described earlier in this Section.
- B. Operation and Maintenance Documentation Directory: Prepare as described earlier in this Section.
- C. Emergency Data: Prepare as described earlier in this Section.
- D. Product Maintenance Data: Prepare as described earlier in this Section.
- E. Operation and Maintenance Data: Prepare as described earlier in this Section.
- F. Manufacturers' Data: Prepare as described earlier in this Section.
  - 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- G. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.
  - 1. Do not use original Project Record Documents as part of operation and maintenance manuals.
  - 2. Comply with requirements of newly prepared Record Drawings in [01 78 39 PROJECT RECORD DOCUMENTS \(AS BUILTS AND RECORD SET\)](#).
- H. Comply with [01 77 00 CLOSEOUT PROCEDURES](#) for the schedule for submitting operation and maintenance documentation.

**END OF SECTION**

## **01 78 36 WARRANTIES**

### **PART 1 GENERAL**

#### **1.01 RELATED DOCUMENTS**

- A. [00 72 13 GENERAL CONDITIONS](#) for additional warranty requirements.
- B. [01 60 00 PRODUCT REQUIREMENTS](#) for additional warranty requirements.
- C. [01 73 29 CUTTING AND PATCHING](#) for additional warranty requirements.
- D. [01 77 00 CLOSEOUT PROCEDURES](#) for additional warranty requirements.

#### **1.02 SUMMARY**

- A. This section specifies general administrative and procedural requirements for warranties required by the Contract Documents, including manufacturer's standard warranties on products and special warranties.
  - 1. Refer to the Contract and General Conditions for terms of the Contractor's warranty of workmanship and materials.
  - 2. General closeout requirements are included in [01 77 00 CLOSEOUT PROCEDURES](#).
  - 3. Specific requirements for warranties for the Work and products and installations that are specified to be warranted are included in the individual Sections of **Divisions 02-35**.
  - 4. Certifications and other commitments and agreements for continuing services to City are specified elsewhere in the Contract Documents.
- B. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

#### **1.03 DEFINITIONS**

- A. Standard Product Warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the City.
- B. Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the City.

#### **1.04 WARRANTY REQUIREMENTS**

- A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.

- B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the City has benefited from use of the Work through a portion of its anticipated useful service life.
- D. City's Recourse: Written warranties made to the City are in addition to implied warranties, and do not limit the duties, obligations, rights, and remedies otherwise available under the law, nor may warranty periods be interpreted as limitations on time in which the City can enforce such other duties, obligations, rights, or remedies.
  - 1. Rejection of Warranties: The City reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
- E. The City reserves the right to refuse to accept or pay for Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entitles required to countersign such commitments are willing to do so.

## 1.05 SUBMITTALS

- A. Submit written warranties to the City's Representative prior to the date certified for Substantial Completion. All warranties shall indicate that they commence upon the date of Project's Final Acceptance of the Work by City Council. As this date will not be established upon the warranty submittal, the start date shall read: "The date of Project's Final Acceptance of the Work by City Council". The Contractor will be notified of this date when established and it shall be made a matter of unalterable public record, open to all.
- B. Prepare a written document utilizing the appropriate form, ready for execution by the Contractor, or the Contractor and subcontractor, supplier or manufacturer. Submit a draft to the City through the City's Representative for approval prior to final execution. Refer to individual Sections of Division 02 for specific content requirements, and particular requirements for submittal of special warranties.
- C. Form of Submittal: At least ten (10) calendar days prior to Substantial Completion compile and submit digital copies of each required warranty and bond properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on 00 00 01 TABLE OF CONTENTS of the Project Manual.

## PART 2 PRODUCTS

(NOT USED)



## **PART 3 EXECUTION**

### **3.01 SCHEDULE OF WARRANTIES**

- A. Schedule: In addition to a general Project warranty, provide warranties and bonds on products and installations as specified in the respective Project Manual Sections.

### **3.02 MINIMUM FORMAT AND CONTENT OF WARRANTIES**

- A. The minimum content of all warranties includes the following terms, or they have attached a cover letter including the following:

[I, We] [Name of Contractor], hereby certify that [Name of Trade or Portion of Work warranted] that was installed by [Name of Subcontractor] on [Project Name] at [Street Address or other exact location description] is work performed in strict compliance with the Contract Documents. [I, We] further warrant this work to be [watertight, fully operational, other (describe)] and free from defects in materials and workmanship for [warranty period in years] from date of Final Acceptance of the City Council or, in accordance with the General Conditions of the Contract, for concealed work not visible or apparent upon conducting a reasonable investigations, until the defect is discovered by the City in that work, and will repair or replace without delay any defects in material and workmanship discovered within the warranty period. [I, We] acknowledge that failure to proceed with terms of the warranty within ten (10) calendar days of notification, entitles the City to have the defects corrected and that [I, we] and [my, our] surety are liable for all expenses incurred by the City. [I, We] further acknowledge that in case of emergency where, in the opinion of the City or Design Professional, delay would cause serious loss or damage or allow a public health or safety risk to exist, repairs may be made without notice being given to [me, us] and [I, we] and [my, our] surety will remain liable for all expenses incurred.

Yours truly,

[Signature of authorized agent or officer]

[Printed Name][Title]

[Name of Contractor, address, email and telephone number]

**END OF SECTION**

**01 78 39 PROJECT RECORD DOCUMENTS (AS BUILTS AND RECORD SET)**

**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

- A. [01 30 00 ADMINISTRATIVE REQUIREMENTS](#) for additional administrative requirements.

**1.02 SUMMARY**

- A. This Section specifies administrative and procedural requirements for Project Record Documents. Digital copies to be provided in PDF form. Do not submit scans of hard copy material. Files should not be flattened.
- B. Project Record Documents required include:
1. Marked-up copies of Contract Drawings
  2. Marked-up copies of Shop Drawings
  3. Marked-up copies of Technical Specifications, Addenda, and Change Orders
  4. Marked-up Product Data submittals
  5. Record Samples
  6. Field records for variable and concealed conditions
  7. Record information on Work that is recorded only schematically
- C. Specific record copy requirements that expand requirements of this Section are included in the individual Sections of **Divisions 02-35**.
- D. General Project closeout requirements are included in [01 77 00 CLOSEOUT PROCEDURES](#).
- E. Maintenance of Documents and Samples: Store Project Record Documents and Samples in the field office apart from Contract Documents used for construction and well protected from any damage or degradation. Do not permit Project Record Documents to be used for construction purposes. Maintain record documents in good order, and in a clean, dry, legible condition. Make documents and samples available at all times for inspection by the Owner's Representative.

**1.03 RECORD DRAWINGS**

- A. Mark-up Procedure: During the construction period, maintain a set of printed Contract Drawings and Shop Drawings for Project Record Document purposes.
1. Mark these Drawings daily when Work is being installed to indicate the actual installation where the installation varies from the installation shown originally. Give particular attention to information on concealed elements which would be difficult to identify or measure and record later. Items required to be marked include but are not limited to:

- a. Dimensional and Elevational changes to the Drawings
  - b. Revisions to details shown on the Drawings
  - c. Plan locations and depths of underground utilities
  - d. Revisions to routing of piping and conduits, either vertically or horizontally
  - e. Revisions to electrical circuitry
  - f. Actual equipment locations
  - g. Locations of concealed internal utilities
  - h. Changes made by Change Order
  - i. Details not on original Contract Documents
2. Mark completely and accurately record prints of Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions. Where Shop Drawings are marked, show cross-reference on Contract Drawings location.
  3. Mark record sets to distinguish between changes for different categories of the Work at the same location.
  4. Mark important additional information that was either shown schematically or omitted from original Drawings.
  5. Note Construction Change Directive numbers, Alternate numbers, Change Order numbers and similar identification.
  6. Responsibility for Markup: Where feasible, the individual or entity who obtained record data, whether the individual or entity is the installer, subcontractor, or similar entity, is required to prepare the mark-up on record Drawings. Accurately record information in an understandable Drawing technique. Record data as soon as possible after it has been obtained. In the case of concealed installations, record and check the mark-up prior to concealment.

#### **1.04 RECORD SPECIFICATIONS**

- A. During the construction period, maintain one copy of the Project Manual, including addenda and modifications issued, for Project Record Document purposes.
- B. Mark the Drawing or Project Manual to indicate the actual installation where the installation varies substantially from that indicated in the originals and modifications issued. Note related Project Record Drawing information, where applicable. Give particular attention to substitutions, selection, of product options, and information on concealed installations that would be difficult to identify or measure and record later.

- C. In each Project Manual or Specifications Section where products, materials, or units of equipment are specified or scheduled, mark the copy with the proprietary name and model number of the product furnished.
- D. Record the name of the manufacturer, supplier and installer, and other information necessary to provide a record of selections made and to document coordination with record Product Data submittals and maintenance manuals.
- E. Note related record Product Data, where applicable. For each principal product specified, indicate whether record Product Data has been submitted in maintenance manual instead of submitted as record Product Data.
- F. Upon completion of mark-up, submit record Specifications or marked up Project Manual to the Owner's Representative for the City's records.

#### **1.05 RECORD PRODUCT DATA**

- A. During the construction period, maintain one copy of each Product Data submittal for Project Record Document purposes.
  - 1. Mark Product Data to indicate the actual product installation where the installation varies substantially from that indicated in Product Data submitted. Include significant changes in the product delivered to the site, and changes in manufacturer's instructions and recommendations for installation.
  - 2. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  - 3. Note related Change Orders and mark-up of Record Drawings, where applicable.
  - 4. Upon completion of mark-up, submit a complete set of record Product Data to the Owner's Representative for the City's records.
  - 5. Where record Product Data is required as part of maintenance manuals, submit marked-up Product Data as an insert in the manual, instead of submittals as record Product Data.

#### **1.06 RECORD SAMPLE SUBMITTAL**

- A. Immediately prior to date of Substantial Completion, the Contractor shall meet with the Owner's Representative and, if desired, the City's personnel, at the site to determine which of the Samples maintained during the construction period will be transmitted to City for record purposes. Comply with the Owner's Representative's instructions for packaging, identification marking, and deliver to City's Sample storage space. Dispose of other Samples in manner specified for disposal of surplus and waste materials.

#### **1.07 MISCELLANEOUS RECORD SUBMITTALS**

- A. Refer to other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Immediately prior to Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for use and reference. Submit to Owner's Representative for the City's records.

**PART 2 PRODUCTS**

(NOT USED)

**PART 3 EXECUTION**

**3.01 RECORDING**

- A. Post changes and modifications to the Documents as they occur. Do not wait until the end of the Project. The Owner's Representative will periodically review record documents to ensure compliance with this requirement.

**END OF SECTION**

## **01 79 00 DEMONSTRATION AND TRAINING**

### **PART 1 GENERAL**

#### **1.01 RELATED DOCUMENTS**

- A. [01 30 00 ADMINISTRATIVE REQUIREMENTS](#) for requirements for preconstruction conferences.

#### **1.02 SUMMARY**

- A. This Section includes administrative and procedural requirements for instructing City's personnel, including the following:
1. Demonstration of operation of systems, subsystems, and equipment
  2. Training in operation and maintenance of systems, subsystems, and equipment

#### **1.03 SUBMITTALS**

- A. Instruction Program: Submit a digital copy of the instructional program outline for demonstration and training, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
1. At completion of training, submit one (1) digital copy of the complete training manuals for City's use.
- B. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of Design Professionals and Owner, and other information specified.
- C. Attendance Record: For each training module, submit list of participants and length of instruction time.
- D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.
- E. Demonstration and Training Video: Submit one (1) digital copy at end of each training module.

#### **1.04 QUALITY ASSURANCE**

- A. Preconstruction Conference: Conduct conference at Project site to comply with requirements in [01 30 00 ADMINISTRATIVE REQUIREMENTS](#). Review methods and procedures related to demonstration and training including, but not limited to, the following:
1. Inspect and discuss locations and other facilities required for instruction.
  2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
  3. Review required content of instruction.

4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

### **1.05 COORDINATION**

- A. Coordinate instruction schedule with City's operations. Adjust schedule as required to minimize disrupting City's operations.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Design Professional.

## **PART 2 PRODUCTS**

(NOT USED)

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a combined training manual.
- B. Set up instructional equipment at instruction location.

### **3.02 INSTRUCTIONS**

- A. Engage qualified instructors to instruct City's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
  1. City will furnish an instructor to describe City's operational philosophy.
  2. City will furnish Contractor with names and positions of participants.
- B. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
  1. Schedule training with City, with at least seven days' advance notice.
- C. Demonstration and Training Video: Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
  1. At beginning of each training module, record each chart containing learning objective and lesson outline.

- D. Cleanup: Collect used and leftover educational materials and remove from Project site. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

**END OF SECTION**



**END    ATTACHMENTS**

**TECHNICAL SPECIFICATIONS**  
**For**  
**Luther Burbank Park Waterfront Improvements**

February 4, 2026

Owner: City of Mercer Island, Public Works Department  
Attn: Sarah Bluvas, CIP Project Manager  
9611 SE 36<sup>th</sup> Street  
Mercer Island, WA 98040  
Phone: (206) 275-7600  
E-mail: [sarah.bluvas@mercerisland.gov](mailto:sarah.bluvas@mercerisland.gov)

Prime Consultant: KPFF Consulting Engineers  
Attn: Will Cyrier, PE, Project Manager, Civil-Structural Group  
1601 5<sup>th</sup> Avenue, Suite 1600  
Seattle, WA 98101  
Phone: (206) 622-5822



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# **DIVISION 02**

## **EXISTING CONDITIONS**

**SECTION 02 41 13  
SITE DEMOLITION**

**PART 1 – GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. The extent and location of the "Demolition" work, including "Select Demolition" is indicated on the Drawings, in the specifications, and as outlined below.
  - 1. Removal and disposal, in whole or in part, of all items as indicated in the Drawings in compliance with the specifications and all agencies of jurisdiction. All items shall become the property of the Contractor unless otherwise noted.
  - 2. Payment of all costs required for disposal of items at legal disposal sites, including all permit fees and related costs.
  - 3. Capping of utilities or other features at demolition limits as indicated on the Drawings.
- B. The demolition details shown on the Drawings are based upon information contained in the reference drawings. The details indicate typical features of the various structures and shall not be construed as complete or adequate to supplant actual on-site inspection, additional review, and interpretation of the reference drawings by the Contractor.
- C. The Contractor shall furnish all labor, materials, tools, equipment, and supervision necessary to perform demolition work as described in the Drawings and these specifications.
- D. Work includes removal of in-water rubbish which will require professional diving.

**1.02 GOVERNING CODES, STANDARDS AND REFERENCES**

- A. The work in this contract shall comply with all applicable Federal, State and Local codes and regulations. Including but not limited to:
  - 1. U.S. Department of Labor Occupational Safety & Health Administration (OSHA) standard 1926.850(a), Preparatory Operations
  - 2. Puget Sound Clean Air Agency (PSCAA)

**1.03 SITE CONDITIONS**

- A. Creosote treated piling and miscellaneous timber has been identified within the area of work for demolition. Contractor shall adhere to the requirements of EPA Region 10 Best Management Practices for Piling Removal and Placement in Washington State (February 18, 2016 Version).

- 
- B. Existing Underground Storage Tanks (USTs) are within the limits of excavation and will need to be partially removed as indicated in the Drawings. The USTs have been reported as previously abandoned in place (cleaned and filled with pea gravel). The Contractor shall provide a certified UST decommissioning contractor to conduct the demolition of the USTs as necessary to complete the cleanup action excavation and placement of new utilities.
  - C. No additional contaminated or hazardous materials as indicated for demolition in the Drawings have been identified on site. If contaminated or hazardous materials are encountered during the demolition process, the Contractor shall submit a change order to provide hazardous material assessment and abatement as needed.

#### **1.04 SUMMARY**

- A. Items and material categories for demolition include, but are not limited to, the following:
  - 1. Utilities and appurtenances including electrical conduit, stormwater pipes, stormwater structures, sanitary sewer pipes, sanitary sewer structures, and other miscellaneous utilities.
  - 2. Concrete and asphalt pavement.
  - 3. Brick and concrete pavers.
  - 4. Gravel roadways and paths.
  - 5. Split rail fence
  - 6. Concrete dock
  - 7. Creosote timber piles.
  - 8. Creosote wood dock.
  - 9. Aluminum gangway.
  - 10. In-water rubbish and intake pipe.
  - 11. Monitoring wells.
  - 12. USTs
- B. Unless noted otherwise, items encountered and removed as part of this work shall not be salvaged or re-used for this Contract Work and shall become the property of the Contractor and disposed of at an approved disposal site.
- C. All material designated to be salvaged for the City shall be stored or provided to the City or handled as specified below:
  - 1. Salvage List:

	Storage/Delivered to:
a. Wood float	Reuse
b. Boulders	Reuse
c. Fencing, Split Rail	Deliver to City
- D. Any damage by the Contractor's operations to materials identified to be protected-in-place or salvaged shall be repaired or replaced, as determined by the Design Professional, by the Contractor and at the Contractor's expense.



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**1.05 SUBMITTALS**

- A. Prior to commencement of demolition work the Contractor shall submit the following pre-construction submittals:
  - 1. Demolition Management Plan (DMP) shall be stamped by a licensed structural engineer in the state of Washington with documentation that includes and addresses the following:
    - a. Work sequence and schedule. Include phased demolition requirements consistent with the overall project schedule and information shown in the Drawings. Include the positioning of equipment in relation to the bulkhead wall.
    - b. Schedule of Selective Demolition: Indicate the following:
      - 1) Detailed sequence of selective demolition, with starting and ending dates for each activity.
      - 2) Interruption of utility services. Indicate how long utility services will be interrupted and coordinate with the City.
      - 3) Coordination for shutoff, capping, and continuation of utility services.
      - 4) Coordination of fire watch (if necessary).
    - c. List of equipment to be used for demolition operations complete with weights, maximum reactions during use, and diagrams of reach.
    - d. Means and methods to prevent demolition materials, debris, or any foreign objects from entering Lake Washington as well as procedure for retrieval of material that enters the lake.
    - e. Laydown areas for materials management.
    - f. Protection of the public.
    - g. Protection of workers or other persons in areas surrounding the demolition site.
    - h. Means and methods to minimize waste.
    - i. Disposal procedures and disposal site(s) approved by the Design Professional and all environmental agencies, including permits and permissions as necessary.
    - j. Protection of the environment. Including capture of all water used for dust control or other applications.
- B. If the DMP is revised, resubmit with any proposed changes for review by the Design Professional prior to incorporating changes to means, methods, equipment, tools, temporary supports, etc.
- C. Closeout Submittal: When approved by the Design Professional to cut off piles, the Contractor shall provide the location of all the cut piles using a GPS or survey.
- D. Closeout Submittal - Inventory: Submit a list of items that have been removed.

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- E. Post in-water rubbish removal documentation. Submit digital photos and/or videos of lakebed from similar perspectives as the existing conditions dive survey provided in the Appendix.
    - 1. Provide documentation demonstrating the volume of in-water rubbish removed and the cleared from the lakebed in total cubic yards.

#### **1.06 MATERIAL OWNERSHIP**

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar, and other items of interest or value to The City that may be uncovered during demolition remain the property of The City.
  - 1. Carefully salvage in a manner to prevent damage and promptly return to The City.

#### **PART 2 – MATERIALS**

Not Used.

#### **PART 3 – EXECUTION**

##### **3.01 PREPARATION FOR EXECUTION OF WORK**

- A. The DMP that at a minimum addresses all items specified in Section 1.053.
- B. Utility locates shall be performed prior to start of demolition. Coordinate and resolve with the Design Professional and terminal operators to turn off or de-energize affected services before starting demolition.

##### **3.02 DEMOLITION OF STRUCTURES**

- A. Protect in Place all items indicated in the Drawings to be protected. These items include, but are not limited to, the Boiler Building and its foundations, bulkhead wall and tie-back slab, monitoring wells, portions of upland pavement and ground cover, utilities, some piles and pile caps, and portions of the dock.
- B. The amount of dust and debris resulting from demolition shall be controlled to prevent the spread of dust to other areas of the construction site. The use of water will not be permitted when it will create or result in hazardous or objectionable conditions such as flooding or pollution.
- C. On-site water sources are not available for use by the Contractor unless arranged with the City. The Contractor shall provide tanks, trucks, and a water source as necessary to support Contractor operations and activities.
- D. Completely remove and dispose of all designated items. Infrastructure or materials designated to remain that are damaged by Contractor activities shall be replaced or repaired at the Contractor's expense.

- E. Some areas of selective demolition will be required at the interface between existing structures to be demolished and existing structures to remain. For areas of selective demolition, techniques and tools shall be employed that do not damage the existing material for areas to remain. Use small tools appropriate for the task at hand and additional care for areas of select demolition.
- F. Disposal of all concrete debris shall be at a Contractor-selected recycle site.
- G. At no time shall any debris be allowed to enter the water. The Contractor shall make provisions using floats, falsework, scaffolding, and other means as necessary to prevent debris from falling into the water. All debris that falls into the water, whether it sinks or floats, shall be removed immediately. Contractor shall have a boat available onsite during in-water activities for floating debris retrieval. Removal and disposal of all debris shall occur at no additional cost to the City.
- H. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
  - 1. Strengthen or add new supports when required during progress of selective demolition.

### **3.03 DEMOLITION OF UTILITIES**

- A. Notify the Design Professional a minimum of 72 hours before scheduled demolition of utilities. The Contractor shall schedule with each utility agency the work required by that agency. Meeting the conditions required by the Contract Documents and the affected utility shall be the sole responsibility of the Contractor.
- B. Contractor shall conduct public locates a minimum of 2 business days in advance of ground disturbance. Contractor shall maintain locate markings throughout the duration of the project.
- C. Well in advance of site demolition, the Contractor shall advise the appropriate utility purveyor of the impending action and arrange with each utility for all work required by that utility under this contract. Special conditions required by the utility shall be the sole responsibility of the Contractor. Contact the utilities for bond requirements, if any, prior to bid.
  - 1. Contractor shall cap utilities as shown on the Drawings or as necessary to complete the work as indicated in the Drawings.
  - 2. Contractor shall coordinate with local utility services for disconnection/decommission of any utility connections.

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- D. Sanitary Sewer Lift Station: Remove and dispose of equipment and pumps from existing vault. Demolish vault within (1) foot of finish grade, fill portions of vault to remain with CDF. Remove sanitary sewer lines as indicated on the Drawings for future connection.
  - E. Electrical items: Remove electrical conduit, fixtures and equipment from the demolition area as indicated on the Drawings for demolition or salvage.
  - F. Water Lines: Remove water and other utility lines as indicated on the Drawings and in accordance with applicable codes.
  - G. Storm Drains: Remove and cap storm drain lines as indicated in the Drawings. Protect in place catch basins and other stormwater appurtenances not indicated for removal or modification as indicated in the Drawings.
  - H. Unknown Utilities: utilities not identified on the plans and discovered in the field shall be brought to the attention of the Design Professional. Unknown utilities shall be verified as abandoned by the Design Professional and City prior to removal.
  - I. Contractor shall protect in place all utilities to remain

### **3.04 DISPOSAL**

- A. General
  - 1. No material shall be disposed of in adjoining waterways (Lake Washington).
  - 2. The Contractor is responsible for the proper disposal of all demolition materials under this Contract in a manner that meets the requirements of federal, state, and local regulations for protecting the health and safety of employees, the public, and for protecting the environment.
  - 3. Applicable WSDOT transportation requirements for waste shall be met, including but not limited to RCW 46.61.655.
  - 4. Contractor shall provide controls to prevent loss of any debris or waste materials during transport to an approved landfill or recycling facility. Should there be any spillage, accident, or loss of debris during transport then the Contractor shall notify the Design Professional to implement an appropriate emergency response.
- B. Cleanup
  - 1. Clean the site after removal of all demolition items and materials. There shall be no debris, rubble or litter left at the site from any of the demolition operations.

### **3.05 MONITORING WELLS**

- A. Monitoring wells indicated in the drawings to be decommissioned shall be decommissioned in accordance with WAC 173-160. Refer to Section 33 24 13 – Monitoring Wells. Boring logs are provided in the project geotechnical reports found in the Appendix.

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**3.06 UNDERGROUND STORAGE TANK**

- A. The Contractor shall notify Ecology, the local fire department, and other agencies in accordance with applicable reporting requirements.
- B. The Contractor shall obtain local, state, or federal permits and licenses that are required to preform the work prior to commencing removal operation.
- C. Remove UST(s) or portions of UST(s) in accordance with regulations.
- D. Dispose of UST(s) or removed portions in a licensed recycling or disposal facility.
- E. Contractor shall complete and provide to the Owner's Representative the Site Assessment Checklist as required by the Washington State Department of Ecology. At a minimum, the Contractor shall provide:
  - 1. Documentation prepared for Ecology, local fire, planning or health department, notices, and closure checklists.
  - 2. A letter signed by a responsible company official certifying that decommissioning services were preformed in accordance with the applicable regulations and the terms and conditions of these Specifications.
  - 3. UST removal checklist and other relevant documentation
  - 4. UST Disposal Certifications: UST disposal certificates signed by the responsible disposal facility official.

**3.07 IN-WATER RUBBISH REMOVAL**

- A. Contractor shall remove in-water rubbish encountered during the project from within the Work Area Limits indicated on the Drawings. In-water rubbish shall be disposed of in accordance with these specifications. In-water rubbish includes, but is not limited to:
  - 1. Building materials such as bricks, concrete, dimensional lumber, and or timbers (assume 2.2 cubic yards)
  - 2. 12" diameter by 15-foot long creosote timber pile (assume 0.44 cubic yards)
  - 3. Tire(s) (assume 0.25 cubic yards)
  - 4. Lawn chair(s) (assume 0.05 cubic yards)
  - 5. Aluminum cans, glass and plastic bottles and containers and general trash (0.2 cubic yards)
  - 6. Concrete intake pipe (assume 0.8 cubic yards)
- B. The Contractor shall clear in-water rubbish, concrete rubble, piping, stones with an average minimum dimension larger than 4-inches, and objects identified for removal by the Owner's Representative from the area proximate to the proposed grated overwater platform, between the north pier and near shore, and the proposed near shore floats (see area indicated on the Drawings). Contractor shall use methods that minimally disturb the vegetation and/or lakebed below the in-water rubbish being removed.

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- C. Place in-water rubbish removal in flexible intermediate bulk containers of approximately one (1) cubic yard in volume.
  - D. Natural materials removed from the in-water debris removal area shall be reused or disposed in accordance with these specifications.

**3.08 DELIVERABLES**

- A. The Contractor shall submit to the Design Professional copies of trip tickets and receiver tickets for all material transported to approved landfills and/or recyclers.

**3.09 QUALITY ASSURANCE**

- A. Contractor shall ensure that any items not set to be demolished, as indicated in the Drawings, shall not be damaged. Any damaged items not intended for demolition shall be repaired or replaced by the Contractor at no additional cost to the City.
- B. The Contractor shall ensure that all demolition debris shall be disposed of at a landfill or recycler appropriately licensed to accept the material.

**END OF SECTION**

# **DIVISION 03**

## **CONCRETE**

**SECTION 03 10 00**  
**CONCRETE FORMING AND ACCESSORIES**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. Section includes:
  - 1. Form-facing materials.
- B. Related Requirements:
  - 1. Section 32 13 13 - Concrete Paving and Miscellaneous Concrete, for formwork related to concrete pavement and walks.

**1.02 DEFINITIONS**

- A. Form-Facing Material: The temporary form materials that come in direct contact with the concrete as part of the formwork components in supporting the concrete while the concrete is setting and gaining sufficient strength to be self-supporting. The most common materials are steel, aluminum, and wood.
- B. Form Lining: Materials used to line the concreting face of formwork to impart a smooth or patterned finish to the concrete surface, to absorb moisture from the concrete, or to apply a set-retarding chemical to the formed surface of the concrete.
- C. Formwork: The total system of support of freshly placed concrete, including the mold or sheathing that contacts the concrete, as well as supporting members, hardware, and necessary bracing.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Shop Drawings: Prepared by, and signed and sealed by, a qualified professional engineer responsible for their preparation, detailing fabrication, assembly, and support of forms.
  - 1. For exposed vertical concrete walls, indicate dimensions and form tie locations.
  - 2. Indicate dimension and locations of construction and movement joints required to construct the structure in accordance with American Concrete Institute (ACI) Specification 301.
    - a. Location of construction joints is subject to approval of the Design Professional.



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3. Indicate proposed schedule and sequence of stripping of forms, shoring removal, and reshoring installation and removal.
  4. Indicate layout of insulating concrete forms, dimensions, course heights, form types, and details.

#### **1.04 INFORMATIONAL SUBMITTALS**

- A. Field quality-control reports.
- B. Qualification Statements: For testing and inspection agency.

#### **1.05 QUALITY ASSURANCE**

- A. Testing and Inspection Agency Qualifications: An independent agency, acceptable to the City, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Form Liners: Store form liners under cover to protect from sunlight.

### **PART 2 – PRODUCTS**

#### **2.01 PERFORMANCE REQUIREMENTS**

- A. Concrete Formwork: Design, engineer, erect, shore, brace, and maintain formwork, shores, and reshores in accordance with ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads, so that resulting concrete conforms to the required shapes, lines, and dimensions.
  1. Design wood panel forms in accordance with APA's "Concrete Forming Design/Construction Guide."
  2. Design formwork to limit deflection of form-facing material to 1/240 of center-to-center spacing of supports.
    - b. For architectural concrete specified in Section 03 33 00 "Architectural Concrete," limit deflection of form-facing material, studs, and walers to 0.0025 times their respective clear spans (L/400).

#### **1.02 FORM-FACING MATERIALS**

- A. As-Cast Surface Form-Facing Material:
  1. Provide continuous, true, and smooth concrete surfaces.
  2. Furnish in largest practicable sizes to minimize number of joints.
  3. Acceptable Materials: As required to comply with Surface Finish designations specified in Section 03 30 00 "Cast-in-Place Concrete", and as follows:

- a. Plywood, metal, or other approved panel materials.
- b. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
  - 1) APA Plyform Class I, B-B or better; mill oiled and edge sealed.

### **1.03 RELATED MATERIALS**

- A. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4-inch, minimum.
- B. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.
  - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
  - 2. Form release agent for form liners to be acceptable to form liner manufacturer.
- C. Form Ties: Factory-fabricated, removable or snap-off, glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
- D. Sealant: One-part moisture cure silicone sealant used with form liners.

## **PART 3 – EXECUTION**

### **3.01 INSTALLATION OF FORMWORK**

- A. Comply with ACI 301.
- B. Construct formwork, so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117 and to comply with the Surface Finish designations specified in Section 033000 "Cast-in-Place Concrete" for as-cast finishes.
- C. Limit concrete surface irregularities as follows:
  - 1. Surface Finish-2.0: ACI 117 Class B, 1/4 inch.
- D. Construct forms tight enough to prevent loss of concrete mortar.
  - 1. Minimize joints.
  - 2. Exposed Concrete: Symmetrically align joints in forms.
- E. Construct removable forms for easy removal without hammering or prying against concrete surfaces.
  - 1. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces.
  - 2. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
  - 3. Install keyways, reglets, recesses, and other accessories, for easy removal.
- F. Do not use rust-stained, steel, form-facing material.

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- G. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces.
    - 1. Provide and secure units to support screed strips
    - 2. Use strike-off templates or compacting-type screeds.
  - H. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible.
    - 1. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar.
    - 2. Locate temporary openings in forms at inconspicuous locations.
  - I. [Do not chamfer] exterior corners and edges of permanently exposed concrete. Provide radius as indicated on construction drawings.
  - J. At construction joints, overlap forms onto previously placed concrete not less than 12 inches.
  - K. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work.
    - 1. Determine sizes and locations from trades providing such items.
    - 2. Obtain written approval of the Design Professional prior to forming openings not indicated on Drawings.
  - L. Form Liners: Install per manufacturer's written installation instructions and recommended tolerances.
  - M. Construction and Movement Joints:
    - 1. Construct joints true to line with faces perpendicular to surface plane of concrete.
    - 2. Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by the Design Professional.
    - 3. Place joints perpendicular to main reinforcement.
    - 4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
  - N. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection.
    - 1. Locate ports and openings in bottom of vertical forms, in inconspicuous location, to allow flushing water to drain.
    - 2. Close temporary ports and openings with tight-fitting panels, flush with inside face of form, and neatly fitted, so joints will not be apparent in exposed concrete surfaces.
  - O. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

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- P. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
  - Q. Coat contact surfaces of forms with form-release agent, in accordance with manufacturer's written instructions, before placing reinforcement.

### **3.02 INSTALLATION OF EMBEDDED ITEMS**

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete.
  - 1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - 2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.
  - 3. Clean embedded items immediately prior to concrete placement.

### **3.03 REMOVING AND REUSING FORMS**

- A. Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for [24] hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations, and curing and protection operations need to be maintained.
  - 1. Leave formwork for beam soffits, joists, slabs, and other structural elements that support weight of concrete in place until concrete has achieved [at least 70 percent of] its 28-day design compressive strength.
  - 2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- B. Clean and repair surfaces of forms to be reused in the Work.
  - 1. Split, frayed, delaminated, or otherwise damaged form-facing material are unacceptable for exposed surfaces.
  - 2. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints.
  - 1. Align and secure joints to avoid offsets.
  - 2. Do not use patched forms for exposed concrete surfaces unless approved by the Design Professional.

**3.04 FIELD QUALITY CONTROL**

- A. Special Inspections: The Owner's Representative will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Testing Agency: the Owner's Representative will engage a qualified testing agency to perform tests and inspections.
- C. Inspections:
  - 1. Inspect formwork for shape, location, and dimensions of the concrete member being formed.
  - 2. Formwork must be available for inspection a minimum of 24 hrs prior to placement of concrete.
- D. Prepare test and inspection reports.

**END OF SECTION**

**SECTION 03 20 00  
CONCRETE REINFORCING**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. Section includes:
  - 1. Steel reinforcement bars.
  - 2. Welded-wire reinforcement.
- B. Related Requirements:
  - 1. 03 30 00 "Cast-In-Place Concrete"
  - 2. Section 32 13 13 "Concrete Paving and Miscellaneous Concrete" for reinforcing related to concrete pavement and walks.

**1.02 ACTION SUBMITTALS**

- A. Product Data: For the following:
  - 1. Each type of steel reinforcement.
  - 2. Bar supports.
  - 3. Mechanical splice couplers.
- B. Shop Drawings: Comply with ACI SP-066:
  - 1. Include placing drawings that detail fabrication, bending, and placement.
  - 2. Include bar sizes, lengths, materials, grades, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, location of splices, lengths of lap splices, details of mechanical splice couplers, details of welding splices, tie spacing, hoop spacing, and supports for concrete reinforcement.
- C. Construction Joint Layout: Indicate proposed construction joints required to build the structure.
  - 1. Location of construction joints is subject to approval of the Design Professional.

**1.03 INFORMATIONAL SUBMITTALS**

- A. Qualification Statements: For delegated design engineer.
- B. Delegated Design Engineer Qualifications: Include the following:
  - 1. Experience providing delegated design engineering services of the type indicated.

- 2. Documentation that delegated design engineer is licensed in the state in which Project is located.
- C. Welding certificates.
  - 1. Reinforcement To Be Welded: Welding procedure specification in accordance with AWS D1.4/D1.4M.
- D. Material Certificates: For each of the following, signed by manufacturers:
  - 1. Epoxy-Coated Reinforcement: CRSI's "Epoxy Coating Plant Certification."
- E. Material Test Reports: For the following, from a qualified testing agency:
  - 1. Steel Reinforcement:
    - a. For reinforcement to be welded, mill test analysis for chemical composition and carbon equivalent of the steel in accordance with ASTM A706/A706M.
  - 2. Mechanical splice couplers.
- F. Field quality-control reports.

#### **1.04 QUALITY ASSURANCE**

- A. Testing Agency Qualifications: An independent agency, acceptable to the City, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.
- B. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.4/D1.4M.

#### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
  - 1. Store reinforcement to avoid contact with earth.

### **PART 2 – PRODUCTS**

#### **2.01 STEEL REINFORCEMENT**

- A. Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed.
- B. Low-Alloy Steel Reinforcing Bars: ASTM A706/A706M, deformed.
- C. Headed-Steel Reinforcing Bars: ASTM A970/A970M.
  - 1. Head Type: HA
- D. Steel Bar Mats: ASTM A184/A184M, fabricated from ASTM A615/A615M, Grade 60, deformed bars, assembled with clips.

- E. Plain-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, plain, fabricated from as-drawn steel wire into flat sheets.
- F. Deformed-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, flat sheet.

## **2.02 REINFORCEMENT ACCESSORIES**

- A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place.
  - 1. Manufacture bar supports from steel wire, plastic, or precast concrete in accordance with CRSI's "Manual of Standard Practice," of greater compressive strength than concrete.
- B. Mechanical Splice Couplers: ACI 318 Type 1, same material of reinforcing bar being spliced.
- C. Steel Tie Wire: ASTM A1064/A1064M, annealed steel, not less than 0.0508 inch in diameter.
  - 1. Finish: Plain.

## **2.03 FABRICATING REINFORCEMENT**

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

# **PART 3 – EXECUTION**

## **3.01 PREPARATION**

- A. Protection of In-Place Conditions:
  - 1. Do not cut or puncture vapor retarder.
  - 2. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.

## **3.02 INSTALLATION OF STEEL REINFORCEMENT**

- A. Comply with CRSI's "Manual of Standard Practice" for placing and supporting reinforcement.
- B. Accurately position, support, and secure reinforcement against displacement.
  - 1. Locate and support reinforcement with bar supports to maintain minimum concrete cover.
  - 2. Do not tack weld crossing reinforcing bars.



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- C. Preserve clearance between bars of not less than 1 inch, not less than one bar diameter, or not less than 1-1/3 times size of large aggregate, whichever is greater.
  - D. Provide concrete coverage in accordance with ACI 318.
  - E. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
  - F. Splices: Lap splices as indicated on Drawings.
    - 1. Bars indicated to be continuous, and all vertical bars to be lapped not less than 48 bar diameters at splices, or 24 inches, whichever is greater.
    - 2. Stagger splices in accordance with ACI 318.
    - 3. Mechanical Splice Couplers: Install in accordance with manufacturer's instructions.
    - 4. Weld reinforcing bars in accordance with AWS D1.4/D 1.4M, where indicated on Drawings.
  - G. Install welded-wire reinforcement in longest practicable lengths.
    - 1. Support welded-wire reinforcement in accordance with CRSI "Manual of Standard Practice."
      - a. For reinforcement less than W4.0 or D4.0, continuous support spacing to not exceed 12 inches.
    - 2. Lap edges and ends of adjoining sheets at least one wire spacing plus 2 inches for plain wire and 8 inches for deformed wire.
    - 3. Offset laps of adjoining sheet widths to prevent continuous laps in either direction.
    - 4. Lace overlaps with wire.

### **3.03 JOINTS**

- A. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Design Professional.
  - 1. Place joints perpendicular to main reinforcement.
  - 2. Continue reinforcement across construction joints unless otherwise indicated.
  - 3. Do not continue reinforcement through sides of strip placements of floors and slabs.
- B. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length, to prevent concrete bonding to one side of joint.

### **3.04 INSTALLATION TOLERANCES**

- A. Comply with ACI 117.

**3.05 FIELD QUALITY CONTROL**

- A. Special Inspections: The City will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Inspections:
  - 1. Steel-reinforcement placement.
  - 2. Steel-reinforcement mechanical splice couplers.
  - 3. Steel-reinforcement welding.

**END OF SECTION**

**SECTION 03 30 00**  
**CAST-IN-PLACE CONCRETE**

**PART 1 – GENERAL**

**1.01 RELATED DOCUMENTS**

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

**1.02 SUMMARY**

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
  - 1. Footings
  - 2. Walls
  - 3. Slabs-on-grade.
  - 4. Concrete stairs
  - 5. Concrete thickened edge
- B. Related Sections:
  - 1. Division 31 "Earth Moving" for drainage fill under slabs-on-grade.
  - 2. Division 32 "Concrete Paving and Miscellaneous Concrete" for concrete pavement and walks.

**1.03 DEFINITIONS**

- A. Backshores: Shores placed snugly under a concrete slab or structural member after the original formwork and shores have been removed from a small area at a time, without allowing the slab or member to deflect or support its own weight or existing construction loads.
- B. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, other pozzolans, slag cement, and silica fume; materials subject to compliance with requirements.
- C. Reshores: Shores placed snugly under a stripped concrete slab or other structural member after the original forms and shores have been removed from a large area, thus requiring the new slab or structural member to deflect and support its own weight.
- D. Shores: Vertical or inclined support members designed to carry the weight of the formwork, concrete, and construction loads above.

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- E. Supplementary Cementitious Materials: Cementitious Materials other than Portland cement.
  - F. W/C Ratio: The ratio by weight of water to cementitious materials.
  - G. Mass Concrete: Concrete placements having a total volume greater than or equal to 250 cubic yards and a thickness of 4'-0" or greater.

#### **1.04 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
  - 1. Indicate amounts of mixing water to be withheld for later addition at Project site.
  - 2. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials.
- C. Steel Reinforcement Shop Drawings: Placing Drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical couplers, tie spacing, spiral spacing, hoop spacing, and supports for concrete reinforcement.
- D. Embedded Item Placement Drawings: Drawings indicating the location and type of plates, anchorages, sleeves or other items to be embedded in cast-in-place concrete members and surfaces.
  - 1. Submit coordinated drawings combining embedded items from all trades.
  - 2. Locate embedded items relative to edges of and openings within concrete members.
- E. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
  - 1. Location of construction joints is subject to approval of the Design Professional.
- F. Contraction Joint Layout: Indicate proposed location of contraction joints not shown on the drawings.
- G. Mass Concrete Procedures: Indicate methods to be utilized to control the heat of hydration and concrete temperatures including thermal gradients to reduce associated cracking. Identify concrete mix design measures including but not limited to use of low heat of hydration cementitious materials and content, increased aggregate size, admixtures, cold water and/or ice. Identify mixing, delivery, placement, and curing procedures of fresh concrete, as well as, temperature control methods including temperature monitoring of hardened concrete following placement.

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1. Include a temperature management plan for all mass concrete. The plan shall include a thermocouple layout diagram and the following minimum requirements for monitoring concrete temperatures:
    - a. Install thermocouples at each of the following locations:
      - 1) Mid-depth of thickest concrete cross section.
      - 2) Within 4 inches of the top surface at thickest concrete section.
      - 3) Within 4-inches of a side surface at mid-depth of thickest edge.
    - b. Provide one additional thermocouple at each thermocouple location as a backup.
    - c. Where thermal modeling is used, adjust thermocouple locations to align with critical locations identified by the model.
    - d. Record thermocouple readings every hour.
    - e. Review thermocouple readings per the following:
      - 1) At twelve-hour intervals for the first 72 hours after placement.
      - 2) At 24-hour intervals from 4 to 14 days after placement.
      - 3) At weekly intervals from 14 days until concrete temperatures at core are below 80 deg F and do not vary by more than 5 degrees for seven consecutive days.
    - f. Use thermocouples or calibrated thermometers to monitor and record ambient temperatures adjacent to the top and side surfaces of the mass concrete at thermocouple group locations.

#### **1.05 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer, manufacturer, and testing agency.
- B. Welding certificates.
- C. Material Certificates: For each of the following, signed by manufacturers:
  1. Cementitious materials.
  2. Admixtures.
  3. Form materials and form-release agents.
  4. Steel reinforcement and accessories. Include mill test certifications for ASTM A 615, Grade 60, bars used as special ductile quality (SDQ) reinforcement.
  5. Fiber reinforcement.
  6. Curing compounds.
  7. Floor and slab treatments.
  8. Bonding agents.
  9. Adhesives.
  10. Semirigid joint filler.
  11. Joint-filler strips.
  12. Repair materials.

- D. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
  - 1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.
- E. Evaluation Reports: ICC-ES or IAPMO-UES report certifying product compliance with IBC 2021 for each of the following:
  - 1. Headed Deformed Bars.
  - 2. Mechanical Bar Couplers.
  - 3. Adhesives for post-installed dowels.
  - 4. Post-installed anchors.
- F. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication, assembly, and support of formwork.
- G. Shoring, Backshoring and Reshoring Procedure: Signed and sealed by a qualified professional engineer:
  - 1. Shop Drawings that indicate proposed schedule and sequence of stripping formwork, shoring removal, and backshoring and reshoring installation and removal. Include the following:
    - a. Location of backshoring and reshoring supports, including relationship to formwork support locations.
    - b. Design criteria used for determining backshoring and reshoring locations.
    - c. Methodology for determination of in-place strength of concrete at time of removal of formwork or shoring.
    - d. Construction loads included in shoring design.
  - 2. Design Calculations for formwork, shoring, backshoring and reshoring.
- H. Curing Procedures: Written procedures indicating proposed methods for curing concrete and that address the following:
  - 1. Timing and rate of application of Evaporation Retarder, Curing Compound , Curing and Sealing Compound.
  - 2. Timing of installation of Moisture-Retaining Cover and Absorptive Cover.
  - 3. Duration of and methods for providing moist cure of Formed and Unformed Surfaces.
  - 4. Adjustments to curing procedures in the event of cold weather or hot weather as defined by ACI 306.1 and ACI 305.1, respectively.
- I. Field quality-control reports.

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**1.06 QUALITY ASSURANCE**

- A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
  - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. Testing Agency Qualifications: An independent agency, acceptable to the City, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
  - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
  - 2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.
- D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M.
- E. Mockups: Cast concrete slab-on-grade and formed-surface panels to demonstrate typical joints, surface finish, texture, tolerances, floor treatments, and standard of workmanship.
  - 1. Build panel approximately 200 sq. ft. (18.6 sq. m) for slab-on-grade and 100 sq. ft. (9.3 sq. m) for formed surface in the location indicated or, if not indicated, as directed by the Design Professional.
  - 2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. Keep reinforcement off ground by using pallets, dunnage, or other supports.

**1.08 FIELD CONDITIONS**

- A. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
  - 1. When average of highest and lowest ambient temperature from midnight to midnight is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain

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delivered concrete mixture temperature within the temperature range required by ACI 301.

2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

**B. Hot-Weather Placement: Comply with ACI 305.1 and as follows:**

1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

**1.09 REDESIGN**

**A. Redesign or Departures from Requirements of the Contract Documents Initiated by Contractor:**

1. Obtain written acceptance from the Design Professional and/or Design Professional's consultants.
2. Bear costs for Contractor-initiated or construction error-caused changes to type, form, system, or details of construction from those indicated by the Contract Documents.
3. Pay fees required by Design Professional and/or Design Professional's consultants for review of such changes.

**PART 2 – PRODUCTS**

**2.01 CONCRETE, GENERAL**

**A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:**

1. ACI 301 "Specifications for Structural Concrete."
2. ACI 117 "Specification for Tolerances for Concrete Construction and Materials".
3. ACI 305.1 "Specification for Hot Weather Concreting"
4. ACI 306.1 "Standard Specification for Cold Weather Concreting"
5. ACI 308.1 "Specification for Curing Concrete"
6. ACI 318 "Building Code Requirements for Structural Concrete".



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**2.02 FORM-FACING MATERIALS**

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
  - 1. Plywood, metal, or other approved panel materials.
  - 2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
    - a. High-density overlay, Class 1 or better.
    - b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
    - c. Structural 1, B-B or better; mill oiled and edge sealed.
    - d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.
  - 3. Overlaid Finnish birch plywood.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.
- D. Pan-Type Forms: Glass-fiber-reinforced plastic or formed steel, stiffened to resist plastic concrete loads without detrimental deformation.
- E. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.
- F. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.
- G. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- H. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.
  - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- I. Form Ties: Factory-fabricated, removable or snap-off glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
  - 1. Furnish units that leave no corrodible metal closer than 1 inch (25 mm) to the plane of exposed concrete surface.
  - 2. Furnish ties that, when removed, leave holes no larger than 1 inch (25 mm) in diameter in concrete surface.

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3. Furnish ties with integral water-barrier plates to walls indicated to receive damp proofing or waterproofing.

## **2.03 STEEL REINFORCEMENT**

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.
- C. Plain-Steel Wire: ASTM A 1064/A 1064M, as drawn.
- D. Plain-Steel Welded Wire Reinforcement: ASTM A 1064/A 1064M, plain, fabricated from as-drawn steel wire into flat sheets.

## **2.04 REINFORCEMENT ACCESSORIES**

- A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars, cut true to length with ends square and free of burrs.
- B. Epoxy-Coated Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars, ASTM A 775/A 775M epoxy coated.
- C. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating; compatible with epoxy coating on reinforcement and complying with ASTM A 775/A 775M.
- D. Zinc Repair Material: ASTM A 780/A 780M.
- E. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place according to CRSI RB4.1-2016, "Supports Used for Reinforcement in Concrete". Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI RB4.1-2016 of greater compressive strength than concrete and as follows:
  1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
- F. Headed Deformed Bars: ASTM A 970/A 970 M.
- G. Mechanical Bar Couplers: Type 1 or Type 2 as indicated. Type 1 mechanical splices shall develop 125 percent of the specified yield strength of the spliced bars in both tension and compression. Type 2 mechanical splices shall develop the specified tensile strength of the spliced bars in tension in addition to meeting Type 1 mechanical splice requirements.

## **2.05 CONCRETE MATERIALS**

- A. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- B. Cementitious Materials:

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1. Portland Cement: ASTM C 150, Type I/II, gray.
  2. Fly Ash: ASTM C 618, Class F or C.
  3. Slag Cement: ASTM C 989, Grade 100 or 120.
  4. Blended Hydraulic Cement: ASTM C 595, Type IS (<70) (portland blast-furnace slag), Type IP (portland-pozzolan), Type IL (portland-limestone), Type IT (S<70) (ternary blended) cement.
  5. Silica Fume: ASTM C 1240, amorphous silica.
- C. Normal-Weight Aggregates: ASTM C 33, Class 3M coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.
1. Maximum Coarse-Aggregate Size: Unless maximum coarse aggregate size is otherwise specified, the maximum aggregate size shall not exceed:
    - a. Three-fourths of the minimum clear spacing between individual reinforcing bars or wires, bundles of bars, prestressed reinforcement, individual tendons, bundled tendons or ducts.
    - b. One-fifth of the narrowest dimension between the sides of the forms.
    - c. One-third of the depth of the slabs or toppings
- D. Air-Entraining Admixture: ASTM C 260.
- E. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
  2. Retarding Admixture: ASTM C 494/C 494M, Type B.
  3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
  4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
  5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
  6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.
  7. Viscosity Modifier: ASTM C 494/C 494M, Type S.
- F. Color Pigment: ASTM C 979/C 979M, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.
1. Color: As selected by Design Professional from manufacturer's full range.
- G. Water: ASTM C 94/C 94M and potable.
1. Do not use undocumented nonpotable water for concrete mixes.

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2. Recycled water may be used in conformance with ASTM C 94, including optional chemical limits
  3. Wash water may be used in conformance with ASTM C1602.

## **2.06 CURING MATERIALS**

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.
- E. Clear, Solvent-based, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

## **2.07 RELATED MATERIALS**

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.
- B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80.
- C. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; of width and thickness indicated; formulated from felt, neoprene, urethane, or PVC.
- D. Bonding Agent: ASTM C 1059/C 1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.
- E. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
  1. Types I and II, non-load-bearing or Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- F. Reglets: Fabricate reglets of not less than 0.022-inch- (0.55-mm-) thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.
- G. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch (0.85 mm) thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.
- H. Plastic Bearing Pads: Non-leaching, non-staining, high-density polyethylene or high impact polystyrene with a minimum compressive strength of 6,000 psi.

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**2.08 REPAIR MATERIALS**

- A. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch (6.4 mm) and that can be filled in over a scarified surface to match adjacent floor elevations.
  - 1. Cement Binder: ASTM C 150/C 150M, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
  - 2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
  - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by topping manufacturer.
  - 4. Compressive Strength: Not less than [5000 psi (34.5 MPa)] <Insert strength> at 28 days when tested according to ASTM C 109/C 109M.

**2.09 CONCRETE MIXTURES, GENERAL**

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301 (ACI 301M).
  - 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete in as follows:
  - 1. Fly Ash: 25 percent.
  - 2. Combined Fly Ash and Pozzolan: 25 percent.
  - 3. Slag Cement: 50 percent.
  - 4. Silica Fume: 10 percent.
  - 5. Combined Fly Ash, Pozzolans, and Silica Fume: 35 percent with fly ash pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
  - 6. Combined Fly Ash or Pozzolans, Slag Cement, and Silica Fume: 50 percent with fly ash and pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to the maximum allowed in ACI 318 with the Exposure Class listed on the Contract Documents.
- D. Admixtures: Use admixtures according to manufacturer's written instructions.
  - 1. Use water-reducing, high-range water-reducing, or plasticizing admixture in concrete, as required, for placement and workability.
  - 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

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- 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a w/c ratio below 0.50.
  - 4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
  - E. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.

## **2.010 FABRICATING REINFORCEMENT**

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

## **2.011 CONCRETE MIXING**

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
  - 1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.
  - 2. Batch Tickets: Include the amount of water in the batch from the plant and the remaining water that may be added at the site, if any.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.
  - 1. For mixer capacity of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
  - 2. For mixer capacity larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).
- C. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

## **PART 3 – EXECUTION**

### **3.01 FORMWORK INSTALLATION**

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301 (ACI 301M) to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

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- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117 (ACI 117M).
  - C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
    - 1. Class A, 1/8 inch (3.2 mm) for visible smooth-formed finished surfaces.
    - 2. Class C, 1/2 inch (13 mm), for non-visible rough-formed finished surfaces.
  - D. Construct forms tight enough to prevent loss of concrete mortar.
  - E. Construct forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
    - 1. Install keyways, reglets, recesses, and the like, for easy removal.
    - 2. Do not use rust-stained steel form-facing material.
  - F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
  - G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
  - H. Do not chamfer exterior corners and edges of permanently exposed concrete. Provide radius per contract drawing details.
  - I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
  - J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
  - K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
  - L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

### **3.02 EMBEDDED ITEM INSTALLATION**

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - 1. Install anchor rods and embedded structural steel items, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.

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**3.03 REMOVING AND REUSING FORMS**

- A. Formwork that does not support weight of concrete in place, such as for sides of beams, walls columns and similar parts of the Work, may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.
- B. Leave formwork that supports weight of concrete in place, such as for beam soffits, joists, slabs, and other structural elements, a minimum of 5 days or until concrete has achieved at least 70 percent of its design compressive strength, whichever is longer.
  - 1. Removal of formwork shall be in conformance with approved Shoring, Backshoring and Reshoring Procedures.
  - 2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores. For formwork systems where removal of forms cannot be completed without loosening or disturbing shores, formwork shall be left in place no less than the required shoring duration.
  - 3. Forms that support post-tensioned concrete may be removed after post-tensioned tendons have been stressed and approved by the Design Professional.
- C. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- D. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Design Professional.

**3.04 STEEL REINFORCEMENT INSTALLATION**

- A. General: Comply with CRSI's "Manual of Standard Practice" and CRSI RB4.1 "Standard for Supports for Reinforcement Used In Concrete" for fabricating, placing, and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
  - 1. Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing.



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Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

- F. Defective Work: The following reinforcing steel work will be considered defective and shall be removed and replaced by the Contractor at no additional cost to the Owner:
1. Bars with kinks or bends not shown on the drawings.
  2. Bars damaged due to bending or straightening.
  3. Bars heated for bending.
  4. Reinforcement not placed in accordance with the drawings.

### 3.05 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Design Professional.
1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated.
  2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
  3. Roughen surfaces of joints to full amplitude of approximately 1/4 inches (8 mm) as indicated.
  4. Locate joints for slabs between L/3 and L/5 from end of span. Locate joints for beams within the middle third of span. Joints in girders are not permitted.
  5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
  6. Space vertical joints in walls [as indicated]. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
  7. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
  8. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth as indicated and as follows:
1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 3/8 inch to 1/2 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.

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- 2. Sawed Joints: Form contraction joints with early-entry dry-cut power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/2 inch to 3/8 inch wide joints into concrete as soon as cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks. Cutting of joints shall be made within 4 hours from time of concrete finishing; adjust timing as required to preclude damage to the concrete due to raveling adjacent to the joint.
  - D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
    - 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
    - 2. Terminate full-width joint-filler strips not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished concrete surface where joint sealants, specified in Division 07 Section "Joint Sealants," are indicated.
    - 3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
  - E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Coat one-half of dowel length with form-release agent to prevent concrete bonding to one side of joint where indicated.

### **3.06 CONCRETE PLACEMENT**

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Design Professional.
  - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
  - 1. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
  - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301 (ACI 301M).
  - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer

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and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

- D. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
  - 1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
  - 2. Maintain reinforcement in position on chairs during concrete placement.
  - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
  - 4. Slope surfaces uniformly to drains where required.
  - 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- E. Mass Concrete Placement: Comply with ACI 301. Protect concrete from physical damage and reduced strength that could arise from increased concrete temperatures and thermal gradients.
  - 1. Maintain concrete temperatures below 70 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Liquid nitrogen may be used at Contractor's option.
  - 2. [Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.]
  - 3. Concrete temperatures shall be kept below 160 deg F.
  - 4. Differential concrete temperatures shall not exceed 35 deg F between concrete core and surface.

### **3.07 FINISHING FORMED SURFACES**

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
  - 1. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

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1. Apply to concrete surfaces exposed to public view, to receive a rubbed finish, to be covered with a coating or covering material applied directly to concrete.
- C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where indicated:
1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
  2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix 1 part portland cement to 1-1/2 parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches so color of dry grout matches adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.
  3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix one part portland cement and one part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

### **3.08 FINISHING FLOORS AND SLABS**

- A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch (6 mm) in one direction.
1. Apply scratch finish to surfaces indicated and to receive concrete floor toppings to receive mortar setting beds for bonded cementitious floor finishes.
- C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

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1. Apply float finish to surfaces indicated to receive trowel finish and to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.
- D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
1. Apply a trowel finish to surfaces indicated.
  2. Finish surfaces to the following tolerances, according to ASTM E 1155 (ASTM E 1155M), for a randomly trafficked floor surface:
  3. Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.- (3.05-m-) long straightedge resting on two high spots and placed anywhere on the surface does not exceed 3/16 inch (4.8 mm).
- E. Trowel and Medium -Broom Finish: Apply a first trowel finish to surfaces indicated. While concrete is still plastic, slightly scarify surface with a fine broom.
1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.
- F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.
1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Design Professional before application.

### **3.09 MISCELLANEOUS CONCRETE ITEM INSTALLATION**

- A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.
- D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel finish concrete surfaces.

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**3.010 CONCRETE PROTECTING AND CURING**

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures in accordance with submitted Curing Procedures. Comply with ACI 306.1 for cold-weather protection and ACI 305.1 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
  - 1. Evaporation Retarder may be omitted if the Curing Procedures demonstrate that moisture loss will not exceed 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Such determination must be based upon concrete mix characteristics and ambient environmental conditions at time of placement.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for remainder of curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
  - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
    - a. Water.
    - b. Continuous water-fog spray.
    - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.
  - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
    - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
    - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
    - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies does not interfere with bonding of floor covering used on Project.
  - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy

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rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

- a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer[ unless manufacturer certifies curing compound does not interfere with bonding of floor covering used on Project].
4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

### **3.011 JOINT FILLING**

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
  1. Defer joint filling until concrete has aged at least one month(s). Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.
- C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches (50 mm) deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

### **3.012 CONCRETE SURFACE REPAIRS**

- A. Defective Concrete: Repair and patch defective areas when approved by the Design Professional. Remove and replace concrete that cannot be repaired and patched to the Design Professional's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 (1.18-mm) sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
  1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch (13 mm) in any dimension to solid concrete. Limit cut depth to 3/4 inch (19 mm). Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

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2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar matches surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
  3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Design Professional.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch (0.25 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
  2. After concrete has cured at least 14 days, correct high areas by grinding.
  3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
  4. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch (6 mm) to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
  5. Repair defective areas, except random cracks and single holes 1 inch (25 mm) or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch (19-mm) clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
  6. Repair random cracks and single holes 1 inch (25 mm) or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.



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- E. Perform structural repairs of concrete, subject to Design Professional's approval, using epoxy adhesive and patching mortar.
  - F. Perform structural repairs of the following cracks using epoxy resin adhesive by injection as directed by the Design Professional.
    - 1. Cracks in excess of 0.01 inch (0.25 mm) which extend through the full depth of a slab or wall.
    - 2. Cracks in excess of 0.015 inch (0.38 mm) which do not extend through the full depth of a slab or wall.
    - 3. Cracks which are subject to allowing water leakage through the crack.
  - G. Repair materials and installation not specified above may be used, subject to Design Professional's approval.

### **3.013 FIELD QUALITY CONTROL**

- A. Special Inspections: The City will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Tests and Inspections: As indicated on the structural drawings.
- C. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
- D. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Design Professional but will not be used as sole basis for approval or rejection of concrete.
- E. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Design Professional. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Design Professional.
- F. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- G. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
- H. Measure floor and slab flatness and levelness according to ASTM E 1155 (ASTM E 1155M) within 24 hours of finishing.

### **3.014 PROTECTION OF LIQUID FLOOR TREATMENTS**

- A. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

LUTHER BURBANK PARK WATERFRONT IMPROVEMENTS  
SECTION 03 30 00  
CAST-IN-PLACE CONCRETE

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END OF SECTION

**SECTION 03 40 00  
PRECAST CONCRETE**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. Extent of Work: The extent and location of the “Precast Concrete” Work is indicated on the Drawings. The Work includes the requirements for manufacturing, transporting and placing the precast concrete and associated items required or indicated on the Drawings Information on available information for the building.
- B. Related Documents: The provisions and intent of the Contract, including the General Conditions, Supplementary Conditions and General Requirements, apply to the Work as if specified in this section

**1.02 REFERENCES**

- A. American Society for Testing and Materials (ASTM), Standard Specifications:
  - 1. ASTM A36: Structural Steel
  - 2. ASTM A48: Gray Iron Castings
  - 3. ASTM C478: Precast Reinforced Concrete Manhole Sections
- B. Federal Specification: SS-S-210: Sealing Compound, Preformed Plastic, for Expansion Joints and Pipe Joints.

**1.03 QUALITY ASSURANCE**

- A. Testing and Inspection for Contractor Quality Control: The Contractor shall perform the inspection and tests described below and, based upon the results of these inspections and tests, shall take the action required and shall submit specified reports. Testing shall be performed for each individual Work Area.
  - 1. Inspection of components upon delivery for damage or missing components.
- B. Codes and Standards: In addition to complying with all pertinent codes and regulations, comply with all pertinent recommendations of “Specifications for Structural Concrete for Buildings,” publication ACI 301.

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**1.04 SUBMITTALS**

- A. Shop Drawings: Before any precast concrete items are constructed, submit shop drawings to the Design Professional in accordance with Section 01 33 00 – Submittals of these Specifications.
  - 1. Shop Drawings, including:
    - a. The Contractor shall provide underground utility structures, covers, and lids capable of supporting a AASHTO Load Level 2 unless otherwise noted. Shop drawings shall be submitted and approved by the Design Professional prior to fabrication.
    - b. Design criteria listing the criteria in these Specifications and applicable criteria from the reference documents stated above.
    - c. Signed and sealed design calculations performed by a Professional Design Professional registered in the State of Washington in accordance with the reference documents and additional requirements stated in these Specifications. Buoyancy and bearing pressure calculations shall be provided using the requirements established in the Geotechnical Engineer Design Study included in Appendix B.
    - d. Reinforcing steel location and concrete cover.
    - e. Precast utility vault section weights.
    - f. Layout of all inserts, attachments and openings.
    - g. Location and type of joints.
- B. Product Data:
  - 1. Descriptive details of the manufacturer's proposed standard products, including:
    - a. Precast utility vault sections.
    - b. Precast top slab.
    - c. Precast base slab
    - d. Steps, ladder rungs and other hardware.
    - e. Minimum concrete 28-day compressive strength.
    - f. Cement certification.
    - g. Manhole and catch basin cover and frame, and hatches.
- C. Schedule: Submit the schedule for transporting and placing the precast units for approval by the Design Professional prior to the first scheduled activity.

**1.05 PRODUCT HANDLING**

- A. Handling: Do not lift or move precast units until the concrete has attained 80% of its design strength. Handle units by lifting eyes cast into the units or at lifting points designated on the shop drawings.

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- B. Protection: Use all means necessary to protect the materials of this section before, during and after installation and to protect the installed work and materials of all other trades.
  - C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Design Professional at no additional cost to the Owner

## **PART 2 – PRODUCTS**

### **2.01 DESIGN CRITERIA**

- A. General: ASTM C478, and also:
  - 1. Backfill material: Select Fill or CDF. See Section 31 00 00 – Earthwork.
  - 2. Buoyancy: Design utility vaults for groundwater up to an elevation of +18.67 NAVD 88
  - 3. Bearing Pressure: AASHTO Load Level 2.
- B. Structure Live Load
  - 1. AASHTO Load Level 2

### **2.02 PRECAST SECTIONS**

- A. General:
  - 1. Concrete: Provide Class 4000 or higher meeting WSDOT Standard Specifications for WSDOT type structures type structures as indicated on the Drawings.
  - 2. Cement: ASTM C150, Type II, low alkali or ASTM C595, Type 1L.
  - 3. Top slab opening: Size to support the manhole cover frame.
  - 4. Manhole sections shall be delivered to the site with cast pipe penetrations and pipe connections installed.
  - 5. Lifting eyes: Provide for each section
- B. Manufacturer: Oldcastle Precast, Auburn, WA; Pacific Precast, Vancouver, WA; Wilbert Precast, Yakima, WA; H2 Precast, Wenatchee, WA; or equal.

### **2.03 CONCRETE**

- A. All concrete for this portion of the Work shall conform to the provisions of Section 03 30 00 – Cast-in-Place Concrete of these Specifications for Class 4000 concrete, except that the strength shall not be less than 4000 psi in compressive strength and the slump shall not exceed 4 inches unless otherwise directed in the approved mix design.

### **2.04 REINFORCEMENT**

- A. All reinforcement for this portion of the Work shall conform to the provisions of Section 03 20 00 – Concrete Reinforcing of these Specifications.

**2.05 FINISH**

- A. Precast units shall receive a U-5 finish as defined in Section 03 30 00 – Cast-in-Place Concrete unless indicated otherwise.

**PART 3 – EXECUTION**

**3.01 PREPARATORY REVIEW**

- A. Inspections:
  - 1. Prior to all Work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence
  - 2. Verify that the Work of this section may be performed in strict accordance with all pertinent codes and regulations and the original design
- B. Discrepancies
  - 1. In the event of discrepancy, immediately notify the Design Professional.
  - 2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been resolved.

**3.02 PREPARATION**

- A. Casting Surface:
  - 1. Casting beds or forms shall be specially constructed for that purpose.
  - 2. Casting slab or forms surfaces for precast units shall conform to the provisions of Section 03 30 00 – Cast-in-Place Concrete describing finish tolerances.
- B. Bond Breakers:
  - 1. Areas of the casting surface damaged by the placement of reinforcing steel, inserts, or frames shall be repaired and treated with bond breaker prior to pouring concrete.
  - 2. Exercise extreme care to prevent bond breaker from coating reinforcement or weld plates.
- C. Layout:
  - 1. The location and installation of lift points, special reinforcement required for lifting, and method shall be the responsibility of the Contractor.
  - 2. Lay out each unit such that each unit may be poured in one continuous pour with no construction joints.

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**3.03 REINFORCEMENT**

- A. Furnish and install all reinforcement in strict accordance with the Drawings and with the provisions of Section 03 20 00 – Concrete Reinforcing of these Specifications.

**3.04 CONCRETE PLACEMENT**

- A. General
1. Place all concrete in accordance with the Drawings and the provisions of Section 03 30 00 – Cast-in-Place Concrete of these Specifications.
  2. Place all concrete for precast units within one hour after introduction of water into the mix.
  3. Finish all concrete in accordance with the finish designation and tolerances established in Section 03 30 00 – Cast-in-Place Concrete.
- B. Curing:
1. Keep exposed surfaces of the precast units continuously wet with water for not less than three days after the concrete is placed. Accomplish curing by covering the surface with wet sand, cotton mats, burlap, or white polyethylene sheeting.
  2. Accelerated curing methods, such as the external heating of impervious concrete form and the introduction of saturated steam, may be used with prior approval of the Design Professional. Such methods, outlining the entire technique of heating and cooling to avoid differential temperature stresses, must be submitted in detail for approval by the Design Professional.

**END OF SECTION**

# **DIVISION 04**

## **MASONRY**



**SECTION 04 40 00  
STONE ASSEMBLIES**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. Work described in this section includes furnishing all labor, materials, tools, equipment, and incidentals required for importing, stockpiling, and installing rock and stonework, as described on the Drawings. This includes, but is not limited to, the following:
  - 1. Rock for rock terraces
  - 2. Filter fabric for rock and stone work as shown on the Drawings
  - 3. Backfill for rock and stone work as shown on the Drawings
- B. This section does not include work on the beach. Refer to Section 35 42 00.
- C. All materials in this section shall be imported and obtained by the Contractor.
- D. The Contractor shall calculate its own estimate of the quantity of material to be used for backfill and material placement activities based on the Contractor's own calculation methods, the excavation and design as shown on the Drawings, and the Contractor's means and methods for placement activities to account for the Contractor's equipment tolerances.

**1.02 RELATED SECTIONS**

- A. Section 32 14 13 – Pre-Cast Concrete Unit Paving
- B. Section 33 40 00 – Storm Drainage Utilities
- C. Section 35 42 00 – Waterway Bank Protection

**1.03 TOLERANCES**

- A. The finished surface elevations and gap sizes shall not deviate from the lines and grades shown on the Drawings by more than the tolerances listed in the table below.
- B. Tolerances are measured perpendicular to the indicated neatlines. Extreme limits of the tolerances given shall not be continuous in any direction for more than five times the nominal stone dimension for rock, backfill, and depth of foundation.

**LUTHER BURBANK PARK WATERFRONT IMPROVEMENTS**  
**SECTION 04 40 00**  
**STONE ASSEMBLIES**

<b>NEATLINE TOLERANCES</b>		
<b>Material</b>	<b>Above Neatline feet (inches)</b>	<b>Below Neatline feet (inches)</b>
Foundation/bedding layer	0.10 (1.2)	0.10 (1.2)
Rock terraces	0.3 (4)	0.3 (4)
All other materials	0.10 (1.2)	0.10 (1.2)

- C. The intention is that the Work shall be built generally to the required elevations, slope, and grade, and the outer surfaces shall be even and present a neat appearance. Placed material not meeting these limits shall be removed or reworked as directed by the Owner's Representative. Payment will not be made for excess material that the Contracting Officer permits to remain in place.
- D. Maximum heights for rock terraces are shown on the Drawings and shall not be exceeded.

**1.04 SUBMITTALS**

- A. Material Sources: Submit a list of the sources for all materials to be imported and placed. Coordinate with the Owner's Representative for pre-construction inspection of the source material-supplier facilities.
- B. Data Sheets: The Contractor shall provide documentation that imported materials meet the requirements of these Technical Specifications. Submit material data sheets describing each product listed in this section for evidence of consistency with the Specifications.
- C. Material Samples: The Contractor shall provide the Owner with a 2-gallon sample of quarry spall bedding/drainage layer. For larger materials, including rock for terraces, submit representative photographs and material source locations and shall schedule a manufacturer/quarry visit for material selection. The Contractor shall ensure that the samples are representative of all materials to be imported. Samples shall be provided to the Owner at least 10 working days before the materials represented by the samples are delivered to the site.

**PART 2 – PRODUCTS**

**2.01 ROCK FOR ROCK TERRACES**

- A. Provide Cowlitz Jetty Landscape stone available from Marenakos Rock Center (Preston, Washington; [425] 392-3313) or approved equal. Contractor-provided stone shall consist of the sizes shown on the Drawings. Stone shall be free from segregation, seams, cracks, and other defects tending to destroy its resistance to weather. Imported stone shall conform to

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the requirements for quality described in WSDOT SS Section 9-13.7(1), Rock for Rock Walls, of the Standard Specifications.

## **2.02 FILTER FABRIC FOR ROCK TERRACES**

- A. Filter fabric shall consist of a nonwoven geotextile that is chemically resistant to the conditions to which it will be exposed, meet or exceed the requirements for moderate survivability as noted in Table 1 of Standard Specifications Section 9-33.2(1), and have the following properties:
  - 1. Minimum grab tensile strength of 160 pounds as measured by ASTM International (ASTM) D4632
  - 2. Apparent Opening Size (AOS) of 0.212 millimeters or greater as measured by ASTM D4751
  - 3. Minimum UV resistance of 70% at 500 hours as measured by ASTM D4355
  - 4. An example product that meets these requirements is Mirafi180N. An approved equivalent shall be one that meets or exceeds the criteria in Table 1 of Section 9-33.2(1) of the Standard Specifications.

## **2.03 UNDERDRAIN PIPE**

- A. Refer to Section 33 40 00 – Storm Drainage Utilities.

## **2.04 BACKFILL FOR ROCK TERRACES**

- A. Backfill for rock walls shall conform to Section 9-13.7(2) of the Washington State Department of Transportation *Standard Specifications for Road, Bridge, and Municipal Construction* (current edition).

# **PART 3 – EXECUTION**

## **3.01 BASE PREPARATION**

- A. Areas on which rock and stone are to be placed shall be graded and dressed to conform to grading plans, cross sections, and details shown on the Drawings within an allowable tolerance as stated in Article 1.03. The prepared base shall be approved by the Owner's Representative. Where areas are below the allowable minimum tolerance limit, they shall be brought to grade by fill with earth similar to the adjacent material and compacted to a density equal to the adjacent in-place material. Immediately prior to placing the foundation/base layer, the prepared base will be inspected by the Owner's Representative, and no material shall be placed thereon until that area has been approved.

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**3.02 HANDLING AND INSTALLATION OF FILTER FABRIC**

- A. Filter fabric labeling, shipment, and storage shall follow ASTM D4873. Product labels shall clearly show the manufacturer or supplier name, style name, and roll number. Each filter fabric roll shall be wrapped with a material that will protect the geotextile from damage due to shipment, water, sunlight, and contaminants.
- B. During storage, filter fabric rolls shall be elevated off the ground and adequately covered to protect them from the following: site construction damage, precipitation, extended UV radiation including sunlight, chemicals that are strong acids or strong bases, flames including welding sparks, excess temperatures, and any other environmental conditions that may damage the physical property values of the geotextile.
- C. The installation site shall be prepared by clearing, grubbing, and excavation, or filling the area to the design grade. This includes removal of topsoil and vegetation.
- D. The filter fabric shall be placed in direct and continuous contact with the soils, without wrinkles or folds, on a smooth graded surface approved by the Owner's Representative. The drainage geotextile shall be placed in such a manner that placement of the overlying materials will not excessively stretch or tear the drainage geotextile. Anchoring of the terminal ends of the drainage geotextile shall be accomplished as shown on the Drawings.
- E. The drainage geotextile shall be placed with the roll direction oriented directly upslope. Overlapped seams of roll ends shall be a minimum of 2 feet.
- F. Care shall be taken during installation to avoid damage occurring to the drainage geotextile as a result of the installation process. Prior to covering, the filter fabric shall be inspected by the Owner's Representative to ensure that the material has not been damaged during installation. Should the drainage geotextile be damaged during installation, a geotextile patch extending 2 feet beyond the perimeter of the damage shall be placed over the damaged area.
- G. The stone assembly placement shall begin at the toe and proceed up the slope. Placement shall take place so as to avoid stretching and subsequent tearing of the drainage geotextile.
- H. If placement of material causes damage to the filter fabric, the damaged area shall be repaired as previously described. The placement procedure shall then be modified to eliminate further damage from taking place.
- I. Slope protection and spalls smaller than 100 pounds shall not be dropped from a height exceeding 1 meter (3.28 feet), or a demonstration showing that the placement procedures will not damage the drainage geotextile will be provided.
- J. Following placement of spalls, grading of the slope shall not be permitted if the grading results in movement of the spalls directly above the drainage geotextile.
- K. Field monitoring shall be performed to verify that the spalls do not damage the drainage geotextile.
- L. Any drainage geotextile damaged during backfill placement shall be replaced as directed by the Owner's Representative at the Contractor's expense.

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- M. The Contractor shall comply with the manufacturer's handling requirements for the drainage geotextile.

### **3.03 INSTALLATION OF BACKFILL**

- A. Refer to Section 33 40 00 – Storm Drainage Utilities for subdrain.
- B. General:
1. Material shall be spread uniformly on the geotextile to the slope lines and grades as indicated in the Contract Documents and in such manner as to avoid damage to the prepared base. Placing materials by methods that tend to segregate the particle sizes within the bedding layer or cause mixing of the separate layers will not be permitted. Placement shall not damage the geotextile.
- C. Foundation/base layer:
1. Placement shall begin at the bottom of the area to be covered in one lift. The foundation/base layer shall be compacted to 95% dry density prior to placement of any subsequent layers of rock material and approved by the Owner's Representative. Any damage to the surface of the prepared base during placement of the material shall be repaired before proceeding with the Work.
- D. Backfill for rock terraces:
1. The Contractor shall place backfill between the face of the embankment and rear of the rock and stone. The drainage filter shall be a minimum thickness as shown on the Drawings.

### **3.04 CONSTRUCTION OF ROCK TERRACES**

- A. Terraces shall be constructed at the locations and to the limits indicated on the Drawings or as otherwise needed to provide stable slopes below and directly above the trail. The subgrade elevation and location of the terrace shall be staked in the field and approved by the Owner's Representative prior to construction.
- B. Terrace Keyway: The first step in terrace construction, after clearing and general site preparation, is to excavate a keyway for the base course of the rock terrace or bottom layer of the rock terrace. The keyway shall be a minimum of 6 inches deep (as shown on the Drawings) extending over the entire length of the terrace and shall incline slightly downward toward the face of the cut or fill being protected.
- C. Rock Selection: The Contractor shall have sufficient working space so individual rock selection from a number of stockpiled rocks can satisfy the needs of the Project. Rocks for rock terraces shall be of a generally cubical, tabular, or rectangular shape, as opposed to rounded or tetrahedral forms, and shall be placed to match the spaces afforded by the next

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lower course of rocks as closely as possible. One-man rocks shall not be used on rock terraces more than 3 feet high.

- D. Rock Placement for Rock Terraces: The thickness of the rock terrace, including the filter layer behind it, shall be approximately 40% of its height. On all rock terrace walls install underdrain pipe as shown in Drawings and as specified in Section 33 40 00 – Storm Drainage shall be installed in a keyway behind the rock terrace with sufficient gradient to initiate flow and be piped to the outfall locations as shown on the Drawings. Owner's Representative to be notified to review and approve construction of wall.
1. The Contractor shall place the first course of rock on a layer of bedding layer rock over firm, unyielding soil (having a minimum load-bearing capacity of 2,000 pounds per square foot) at base elevations. There shall be full contact between the bedding layer rock and soil. This may require shaping of the ground surface or slamming or dropping the rocks into place when appropriate so the soil foundation conforms to the shape of the rock face bearing on it. As an alternative, it may be necessary to place quarry spalls into the subgrade to increase its load-bearing capacity. Before placing the next level of rock terrace, the Contractor shall place any quarry spalls behind and to the top of the rocks previously placed.
  2. For rock terraces, the largest rocks shall be used at the bottom and progressively smaller rocks toward the top. The rocks shall be placed so there are no continuous joint planes in either the vertical or lateral direction. Each rock shall bear at least two rocks below it, have at least three contact surfaces, and be set stable with no rocking.
  3. Rocks shall be placed in a manner that there is some bearing between flat rock faces rather than on joints. Horizontal joints between rock courses shall slope downward toward the embankment being protected.
  4. The batter of the rock terrace shall conform to the Drawings. The batter of the rock terrace shall be uniformly the same throughout the length of the rock terrace. The face of individual rocks may vary no more than 3 inches from the batter or slope line of the rock terrace.
  5. Where voids greater than 4 inches in dimension exist in the face of the rock terrace, they shall be visually examined to determine if contact between the rocks exists within the thickness of the rock terrace. If there is contact, no further action is required, but if there is no rock contact within the rock terrace thickness, some resetting is required. If there is a void measuring 6 inches or more near the inside face of the rock terrace, the void shall be chinked with a smaller piece of rock. This filler rock shall be placed with the longest dimension perpendicular to the face.
  6. If stability of an unprotected cut slope is of concern, the rock terrace shall be constructed in short lengths. The final course shall be an even appearance and shall be placed to minimize erosion of the protected embankment.

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- E. Slope Above Rock Terrace: The slope of the terrain above the terrace shall be no steeper than 3 horizontal to 1 vertical to minimize an earth surcharge on the rock terrace. Additional grading or wall height may be required to meet this requirement. The unimproved area above the rock terrace shall be mulched for erosion control.

**END OF SECTION**

# **DIVISION 05**

## **METALS**



**SECTION 05 05 27**  
**METAL CONNECTORS – ADJUSTABLE BEAM FASTENERS**

**PART 1 – GENERAL**

**1.01 RELATED DOCUMENTS**

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

**1.02 SUMMARY**

- A. Section Includes:
  - 1. Lindapter Girder Clamps\*.
    - a. AF.
    - b. AAF.
- B. Related Requirements:
  - 1. Section 05 12 00 "Structural Steel Framing".
  - 2. Section 05 50 00 "Metal Fabrications" for miscellaneous steel fabrications and other steel items not defined as structural steel.

**1.03 DEFINITIONS**

- A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."
- B. Lateral-Force-Resisting System: Elements of structural-steel frame designated as "LFRS" or along grid lines designated as "LFRS" on Drawings, including columns, beams, and braces and their connections.
- C. Girder Clamps: Products designed and tested to provide a steel clamping system for facilitating connections between steel sections as an alternative to drilling or welding. The permanent or temporary clamping method enables steel connections by securely fastening two steel sections together.
- D. Clamp Nose: Part of the clamp that touches the supported or supporting beam.
- E. Clamp Tail: Part of the clamp that touches the end plate or location plate. In uncommon cases and if the member flange is thick enough, this can also be the supported or supporting beam.
- F. Location Plate: The plate required when securing two or more steel members or sections together where clamps are located on either side of the joint. Clamps are present under both the bolt head and nut.

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- G. End Plate: The plate required when securing two or more steel members or sections together where a clamp is located on only one side of the joint. A clamp is present on one side of the bolt, either the bolt head or nut.
  - H. Washer: Clamp accessory used to fill the recess of the clamp to convert the piece into a flat top clamp.
  - I. Rocking Washer: Clamp accessory used in adjustable clamps to create a flat top by self-adjusting to suit a range of flange thicknesses.
  - J. Saddle Washer: Clamp accessory used in adjustable clamps to create a flat top by self-adjusting to suit a range of flange thicknesses. May also be referred to as 'Saddle' for short.
  - K. Packing Piece: Steel shim used under the tail to increase the clamping thickness of the clamp.
  - L. Parallel Flange: Steel member where the flange is constant thickness.
  - M. Tapered Flange: Steel member where one side of the flange tapers. This is typically seen in S beams and MC / C channels.
  - N. Slotted Clearance Hole: Hole slotted for adjustment while allowing for the clamp tail to span the hole.
  - O. Type CF Nose: Part of clamp that hooks over flange or angle leg opposite of the bolt side.
  - P. Type CF Leg: Part of clamp that hooks over flange or angle leg on same side as bolt.
  - Q. Approved Connection: A clamping system connection that is designed, installed, and inspected in accordance with the International Code Council Evaluation Service (ICC-ES) – Evaluation Report ESR-3976, including ESR-3976 LABC and LARC supplement and ESR-3976 CBC and CRC Supplement.

#### **1.04 COORDINATION**

- A. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.
- B. Refer to manufacturer's literature for the following:
  - 1. Component applicability for parallel flanges, tapered flanges, and slotted clearance holes.
  - 2. Available combination of clamps, finishes, bolt type, and bolt diameter.
- C. Coordinate availability of bolt size, length, and material.

#### **1.05 ACTION SUBMITTALS**

- A. Shop Drawings: See Sections 05 12 00 "Structural Steel Framing" and 05 50 00 "Metal Fabrications" for additional requirements.
  - 1. Indicate material or finish, tail type, and clamp size.

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- 2. Indicate steel finishes, hole diameters, bolt diameters, and installation torque.
  - 3. Identify members and connections of the Lateral-Force-Resisting System where required by the governing building code.
- B. Delegated-Design Submittal: For structural-steel connections indicated to comply with design loads, include analysis data signed and sealed by a qualified professional or structural engineer responsible for their preparation. The engineer shall be licensed in the state, providence, or territory where the project is located.

#### **1.06 INFORMATIONAL SUBMITTALS**

- A. Product Data: For each type of product.
- B. Qualification Data: As required by above specification sections in Related Requirements.
- C. Mill test reports for selected products, including chemical and physical properties. All materials shall be attained from countries that are on the United States government's approved list for Buy America Act or Buy American Act as required by the contract.
- D. Product Test Reports: As required by the Engineer of Record, reports will be provided for the Girder Clamps.
- E. Quality-control reports from manufacturing or assembly facility.
- F. Field quality-control and/or special inspection reports where required by the governing code or as required by the Engineer of Record.

#### **1.07 QUALITY ASSURANCE**

- A. Fabricator Qualifications: As required by above specification sections in Related Requirements.
- B. Installer Qualifications: As required by above specification sections in Related Requirements.
- C. Comply with applicable provisions of the following specifications and documents:
  - 1. AISC 303.
  - 2. AISC 341 and AISC 341s1.
  - 3. AISC 360/370.
  - 4. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
  - 5. International Building Code or local adopted code.
  - 6. International Code Council Evaluation Service (ICC-ES) – Evaluation Report ESR-3976, including ESR-3976 LABC and LARC supplement and ESR-3976 CBC and CRC Supplement.
  - 7. Manufacturer's published data.

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**1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Store materials to permit easy access for inspection and identification. Keep materials off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect packaged materials from corrosion and deterioration.
- B. Store fasteners in a protected place in containers with manufacturers or distributor labels intact.
  - 1. Fasteners may be repackaged once on-site provided Owner's testing and inspecting agency observes repackaging and seals containers.
  - 2. If clamps, bolts, or accessories become dry or rusty, do not clean and relubricate bolts and nuts. Contact Lindapter for an appropriate directive or replace damaged or rusty components.

**PART 2 – PRODUCTS**

**2.01 PERFORMANCE REQUIREMENTS**

- A. Provide details of connections required by the Contract Documents to be selected or completed by structural-steel fabricator, to withstand loads indicated and comply with other information and restrictions indicated.
  - 1. Use Load and Resistance Factor Design; data are given at factored-load level.
    - a. Tension: 40,600 lbs per 4 bolt group
    - b. Slip: 8,140 lbs per 4 bolt group
- B. Refer to Lindapter literature for requirements, such as:
  - 1. Minimum plate thickness.
  - 2. Minimum bolt spacing.
  - 3. Minimum bolt edge distance.
  - 4. Installation torque.

**2.02 TYPE AF GIRDER CLAMP®**

- A. Heavy duty clamp. Spheroidal Graphite Iron; EN 1563 Grade EN-GJS-600-3.
- B. Tail length:
  - 1. Short.
- C. Finish: Hot dip galvanizing complying to EN ISO 1461.
- D. Compatible bolts:
  - 1. ASTM F3125 Grade A325.
  - 2. ASTM F3125 Grade A490.
- E. Size:

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1. LAF075 ( $\frac{3}{4}$ ").

- F. Type AFW Washer: Required for use with LAF100 and all ASTM F3125 Grade A325 or ASTM F3125 Grade A490 bolts.

### 2.03 TYPE AAF GIRDER CLAMP®

- A. Heavy duty clamp. Low Temperature Spheroidal Graphite Iron; EN 1563 Grade EN-GJS-400-18LT.
- B. Tail length: Not applicable.
- C. Finish: Hot dip galvanizing complying to EN ISO 1461.
- D. Compatible bolts:
1. ASTM F3125 Grade A325.
  2. ASTM F3125 Grade A490.
- E. Size:
1. LAF075 ( $\frac{3}{4}$ ").
- F. Type AFW Washer: Not applicable.

### 2.04 BOLTS & CONNECTORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM F3125 Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade C, heavy-hex carbon-steel nuts; and ASTM F436, Type 1, hardened carbon-steel washers; all with plain finish.
1. Direct-Tension Indicators: ASTM F959, Type 325, compressible-washer type with plain finish, where applicable.
- B. High-Strength Bolts, Nuts, and Washers: ASTM F3125 Grade A490, Type 1, heavy-hex steel structural bolts or tension-control, bolt-nut-washer assemblies with splined ends; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436, Type 1, hardened carbon-steel washers with plain finish.
1. Direct-Tension Indicators: ASTM F959, Type 490, compressible-washer type with plain finish, where applicable.
- C. Zinc-Coated High-Strength Bolts, Nuts, and Washers: ASTM F3125 Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH heavy-hex carbon-steel nuts; and ASTM F436, Type 1, hardened carbon-steel washers; all with hot-dip zinc finish.
1. Direct-Tension Indicators: ASTM F959, Type 325, compressible-washer type with mechanically deposited zinc coating finish, where applicable..

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- D. Tension-Control, High-Strength Bolts, Nuts, and Washers: ASTM F3125 Grade 1852, Type 1, heavy-hex or round head assemblies consisting of steel structural bolts with splined ends, ASTM A563 DH heavy-hex carbon-steel nuts, and ASTM F436-1 hardened carbon-steel washers; all with plain finish.
  - E. Tension-Control, High-Strength Bolts, Nuts, and Washers: ASTM F3125 Grade 2280, Type 1, heavy-hex or round head assemblies consisting of steel structural bolts with splined ends, ASTM A563 DH heavy-hex carbon-steel nuts, and ASTM F436-1 hardened carbon-steel washers; all with plain finish.
  - F. Zinc-Coated Tension-Control, High-Strength Bolts, Nuts, and Washers: ASTM F3125 Grade 1852, Type 1, heavy-hex or round head assemblies consisting of steel structural bolts with splined ends, ASTM A563 DH heavy-hex carbon-steel nuts, and ASTM F436-1 hardened carbon-steel washers; all with compatible galvanized finish.
  - G. Machine Bolts, Nuts, and Washers: SAE J429 Grade 5, SAE J995 Grade 5 hex nuts, SAE Grade 5 washers; all with plain finish.
  - H. Alloy Steel Bolts, Nuts, and Washers: ASTM A193 Grade B7, ASTM A194 Grade 2H nuts, ASTM F436 washers; all with plain finish.
  - I. Carbon Steel Bolts, Nuts, and Washers: ASTM A449 Type 1, ASTM A563B hex nut, ASTM A563 DH heavy hex nuts, ASTM F436 washers; all with plain finish.
  - J. Stainless Steel Bolts, Nuts, and Washers: ASTM F593G, ASTM F594 nuts, SS304 or SS316 washers; standard finish.
  - K. Stainless Steel Bolts, Nuts, and Washers: ASTM A320 B8M CL2, ASTM A194 Grade 8M nuts, SS316 washers; standard finish.
  - L. Stainless Steel Bolts, Nuts, and Washers: ASTM A193 B8M CL2, ASTM A194 Grade 8M nuts, SS316 washers; standard finish.
  - M. Flush clamp accessories:
    - 1. Flush Clamp Washer: Malleable cast iron to EN 1562 Grade EN-GJMW-400-5.
    - 2. Flush Clamp Nuts: EN ISO 4032 Property Class 8 Finish: Zinc plating complying to EN ISO 2081 Grade Fe/Zn8/A + JS500.
    - 3. Flush Clamp Lock Nuts: EN ISO 4032 Property Class 4 Finish: Zinc plating complying to EN ISO 2081 Grade Fe/Zn8/A + JS500.
  - N. Additional materials and configurations as indicated on Drawings.

## **2.05 PLATES**

- A. Material shall not be less than the minimum strength required per Lindapter's requirements and literature.
  - 1. Steel: ASTM A36.
  - 2. Steel: ASTM A572 Grade 50.
  - 3. Stainless Steel: ASTM A240 316.

## **2.06 SOURCE QUALITY CONTROL**

- A. For fabrication performed within the shop, provide testing and inspection agency as required by above specification sections in Related Requirements and prepare related test and inspection reports.

## **PART 3 – EXECUTION**

### **3.01 FABRICATION**

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," to AISC 360, and to manufacturer's requirements.
- B. Bolt Holes: Cut, drill, or punch metal surfaces.
- C. Cleaning: As required by above specification sections in Related Requirements.

### **3.02 INSTALLATION**

- A. Install Girder Clamps® according to Lindapter's recommendations.
  - 1. Girder Clamp Assemblies must be installed in accordance with the ICC-ESR 3976 report where applicable, the manufacturer's published installation instructions, and the approved construction documents. The manufacturer's published installation instructions must be included in the packages of Girder Clamps and must be available at the jobsite at all times during installation, together with the approved construction documents.
  - 2. Components not supplied by the report holder, including the steel elements to be connected, the location or end plates, and the bolt assemblies, must comply with the Lindapter specifications and the approved construction documents.
  - 3. Structural steel elements must be aligned, and in contact with the steel location plate or end plate as specified in this evaluation report and the approved construction documents.
  - 4. The Girder Clamp assemblies must be installed with the shank of the bolt in contact with the connected flange material. After installation, the axis of each bolt must be at 90 degrees to the top the clamps or the top of the rocking washer or saddle component of the adjustable clamps.
  - 5. Direct-Tension Indicator or Tension-Control Bolt assemblies shall be installed in accordance with ICC-ESR 3976 report where applicable, and the Specification for Structural Joints Using High-strength Bolts, published by the Research Council on Structural Connections.
- B. Splice members only where indicated.

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- C. Do not enlarge or modify connection or components without approval from Engineer of Record.
  - D. Do not reuse Girder Clamp® assemblies without a visual inspection to verify the components and the protective coatings have not been compromised. Assemblies in dynamic or fatigue application shall not be reused.

### **3.03 FIELD QUALITY CONTROL**

- A. If required by the governing building code, Authority Having Jurisdiction, or the Engineer of Record, provide special inspections according to the following
  - 1. Special Inspections: As required by above specification sections in Related Requirements and in accordance with ICC-ESR 3976.
  - 2. Testing Agency: As required by above specification sections in Related Requirements.
  - 3. Bolted Connections: Inspect and test bolted connections according to AISC 360 Chapter N.

### **3.04 REPAIRS AND PROTECTION**

- A. Do not use damaged Girder Clamps® or hardware.
- B. See above specification sections in Related Requirements for additional information.

**END OF SECTION**



**SECTION 05 12 00**  
**STRUCTURAL STEEL FRAMING**

**PART 1 – GENERAL**

**1.01 RELATED DOCUMENTS**

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

**1.02 SUMMARY**

- A. Section includes:
  - 1. Structural-steel materials.
  - 2. Shrinkage-resistant grout.
  - 3. Shear stud connectors.
- B. Related Requirements:
  - 1. Division 01 "Quality Requirements" for independent testing agency procedures and administrative requirements.
  - 2. Section 05 50 00 "Metal Fabrications" for miscellaneous steel fabrications and other steel items not defined as structural steel.

**1.03 DEFINITIONS**

- A. Structural Steel: Elements of the structural frames indicated on Drawings and as described in ANSI/AISC 303.

**1.04 COORDINATION**

- A. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

**1.05 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated.
  - 1. Structural-steel materials.
  - 2. High-strength, bolt-nut-washer assemblies.
  - 3. Shear stud connectors.
  - 4. Anchor rods.

5. Threaded rods.
  6. Forged-steel hardware.
  7. Slide bearings.
  8. Galvanized repair paint.
- B. Shop Drawings: Show fabrication of structural-steel components.
1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
  2. Include embedment Drawings.
  3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
  4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.
- C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide in accordance with AWS D1.1/D1.1M for each welded joint whether prequalified or qualified by testing, including the following:
1. Power source (constant current or constant voltage).
  2. Electrode manufacturer and trade name, for demand-critical welds.

#### **1.06 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For contractor's qualified professional engineer.
- B. Welding certificates.
- C. Mill test reports for structural-steel materials, including chemical and physical properties.
- D. Product Test Reports: For the following:
1. Bolts, nuts, and washers, including mechanical properties and chemical analysis.
  2. Direct-tension indicators.
  3. Tension-control, high-strength, bolt-nut-washer assemblies.
  4. Shear stud connectors.
  5. Nonshrink grout.
- E. Source quality-control reports.
- F. Design Calculations: Submit design calculations, bearing the seal and signature of a Professional Engineer, employed by the Contractor and registered in the State of Washington, for the following:
1. Connections that differ from that indicated in the contract documents.
  2. Requests for substitution of member sizes or material grades.
  3. Modification of the strength or configuration of structural framing for the convenience to accommodate the erection sequence, construction equipment, and/or material availability.

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4. Calculations shall be in conformance with the reference standards cited herein and shall clearly demonstrate applicability for the intended use.

#### **1.07 QUALITY ASSURANCE**

- A. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.1/D1.1M.
  1. Welders and welding operators performing work on bottom-flange, demand-critical welds are to pass the supplemental welder qualification testing, as required by AWS D1.8/D1.8M. FCAW-S and FCAW-G are to be considered separate processes for welding personnel qualification.
- B. Comply with applicable provisions of the following specifications and documents:
  1. AISC 303.
  2. AISC 360.
  3. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

#### **1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
  1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
- B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
  1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
  2. Clean and relubricate bolts and nuts that become dry or rusty before use.
  3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F3125/F3125M, Grade F1852 bolt assemblies and for retesting bolt assemblies after lubrication.

#### **1.09 REDESIGN**

- A. Redesign or Departures from Requirements of the Contract Documents Initiated by Contractor:
  1. Obtain written acceptance from the Design Professional and/or Design Professional's consultants.

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2. Bear costs for Contractor-initiated or construction error-caused changes to type, form, system, or details of construction from those indicated by the contract documents.
  3. Pay fees required by the Design Professional and/or the Design Professional's consultants for review of such changes.

#### **1.010 EXCEPTIONS TO AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES**

- A. Revise Section 7.14, Correction of Errors, as follows:

"The correction of minor misfits by moderate amounts of reaming or grinding, ~~welding or cutting~~, and the drawing of elements into line with drift pins, shall be considered to be normal erection operations. Errors that cannot be corrected using the foregoing means, or that require ~~major welding, cutting or~~ changes in member or Connection configuration, shall be promptly reported to the Owner's Designated Representatives for Design and Construction and the Fabricator by the Erector, to enable the responsible entity to either correct the error or approve the ~~most efficient and economical~~ method of correction to be used by others."

### **PART 2 – PRODUCTS**

#### **2.01 PERFORMANCE REQUIREMENTS**

- A. Comply with applicable provisions of the following specifications and documents:
1. ANSI/AISC 303.
  2. ANSI/AISC 341.
  3. ANSI/AISC 360.
  4. RCSC's "Specification for Structural Joints Using High-Strength Bolts."
- B. Connection Design Information:
1. Option 1: Connection designs have been completed and connections indicated on the Drawings.
- C. Moment Connections: Type FR, fully restrained.
- D. Construction: Moment frame.

#### **2.02 STRUCTURAL-STEEL MATERIALS**

- A. W-Shapes: ASTM A992/A992M
- B. Channels, Angles, M-Shapes, S-Shapes: ASTM A36/A36M
- C. Plate and Bar: ASTM A36/A36M
- D. Cold-Formed Hollow Structural Sections: ASTM A500/A500M, Grade C structural tubing

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- E. Steel Pipe: ASTM A53/A53M, Type E or Type S, Grade B
  - F. Steel Pipe Piles: ASTM A 252, Grade 3, modified ( $F_y = 50\text{ksi}$ ); seamless or welded
  - G. Welding Electrodes: Comply with AWS requirements

### **2.03 BOLTS AND CONNECTORS**

- A. Zinc-Coated High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers.
  - 1. Finish: Hot-dip zinc coating.
  - 2. Direct-Tension Indicators: ASTM F959/F959M, Type 325-1, compressible-washer type with mechanically deposited zinc coating finish.
- B. Shear Stud Connectors: ASTM A108, AISI C-1015 through C-1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.
- C. Unheaded Anchor Rods: ASTM F 1554, Grade 36 unless noted otherwise.
  - 1. Configuration: Straight.
  - 2. Nuts: ASTM A 563 (ASTM A 563M) heavy-hex carbon steel.
  - 3. Plate Washers: ASTM A 36/A 36M carbon steel.
  - 4. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel.
  - 5. Finish: Hot-dip zinc coating, ASTM A 153/A 153M, Class C.
- D. Threaded Rods: ASTM A 36/A 36M.
  - 1. Nuts: ASTM A 563 (ASTM A 563M) hex carbon steel.
  - 2. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel.
- E. Finish: Hot-dip zinc coating, ASTM A 153/A 153M, Class C.
- F. Threaded Studs:
  - 1. Nelson Stud Welding CPL, or approved equal.
  - 2. Finish: Hot-dip zinc coating, ASTM A 153/A 153M, Class C.
- G. All structural steel members, bolts, nuts, washers, or welds in direct contact with treated timber shall be isolated from the treated timber by shall be galvanized with the equivalent galvanization thickness of G185 or 1.85 oz per square foot.

### **2.04 PRIMER**

- A. Galvanized-Steel Primer: MPI#80.
  - 1. Etching Cleaner: MPI#25, for galvanized steel.
  - 2. Galvanizing Repair Paint: ASTM A780/A780M.

**2.05 SHRINKAGE-RESISTANT GROUT**

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

**2.06 FABRICATION**

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate in accordance with ANSI/AISC 303 and to ANSI/AISC 360.
  - 1. Camber structural-steel members where indicated.
  - 2. Fabricate beams with rolling camber up.
  - 3. Identify high-strength structural steel in accordance with ASTM A6/A6M and maintain markings until structural-steel framing has been erected.
  - 4. Mark and match-mark materials for field assembly.
  - 5. Complete structural-steel assemblies, including welding of unites, before starting coating operations, to the greatest extent possible.
- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
  - 1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.
- C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.
- E. Shear Stud Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Weld using automatic end welding of headed-stud shear connectors in accordance with AWS D1.1/D1.1M and manufacturer's written instructions.
- F. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.
  - 1. Cut, drill, or punch holes perpendicular to steel surfaces. **Do not thermally cut bolt holes or enlarge holes by burning.**
  - 2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
  - 3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

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**2.07 SHOP CONNECTIONS**

- A. High-Strength Bolts: Shop install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint specified.
  - 1. Joint Type: Snug tightened.
  - 2. Install lock washers and/or double nuts at each bolted connection to prevent the bolts from loosening over time.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
  - 1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in ANSI/AISC 303 for mill material.

**2.08 GALVANIZING**

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel in accordance with ASTM A123/A123M.
  - 1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.
  - 2. Galvanize all structural-steel materials, bolts, connectors, and anchors. All field welds on galvanized material shall be coated with brush applied zinc-rich paint complying with these specifications. All steel items embedded in concrete shall be hot-dipped galvanized after fabrication.
  - 3. Steel piles and steel pipe piles shall be galvanized from the top (cut-off elevation) to a minimum of 5 feet below the finished grade or mudline.

**2.09 SOURCE QUALITY CONTROL**

- A. Testing Agency: Owner will engage a qualified testing agency to perform shop tests and inspections and prepare test reports.
  - 1. Allow testing agency access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
  - 2. Bolted Connections: Inspect shop-bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
  - 3. Welded Connections: Visually inspect shop-welded connections in accordance with AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
    - a. Liquid Penetrant Inspection: ASTM E165/E165M.

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- b. Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
    - c. Ultrasonic Inspection: ASTM E164.
    - d. Radiographic Inspection: ASTM E94/E94M.
  - 4. In addition to visual inspection, test and inspect shop-welded shear stud connectors in accordance with requirements in AWS D1.1/D1.1M for stud welding and as follows:
    - a. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear stud connector.
    - b. Conduct tests in accordance with requirements in AWS D1.1/D1.1M on additional shear stud connectors if weld fracture occurs on shear stud connectors already tested.
  - 5. Prepare test and inspection reports.
- B. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

### **PART 3 – EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify, with certified steel erector present, elevations of concrete- and steel-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
  - 1. Prepare a certified survey of existing conditions. Include bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.02 PREPARATION**

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated on Drawings.



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**3.03 ERECTION**

- A. Set structural steel accurately in locations and to elevations indicated and in accordance with ANSI/AISC 303 and ANSI/AISC 360.
- B. Baseplates, Bearing Plates, and Leveling Plates: Clean concrete- and steel-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
  - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
  - 2. Weld plate washers to top of baseplate.
  - 3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
  - 4. Promptly pack shrinkage-resistant grout solidly between bearing surfaces and plates, so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for grouting.
- C. Maintain erection tolerances of structural steel within ANSI/AISC 303.
- D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
  - 1. Level and plumb individual members of structure.
- E. Splice members only where indicated.
- F. Do not use thermal cutting during erection.
- G. Do not enlarge unfair holes in members by burning or using drift pins. Light drifting will be permitted to draw the parts together, but drifting to match unfair holes will not be permitted. Any enlargement of holes necessary to make connections in the field shall be done by reaming with twist drills, care being taken not to weaken the adjoining metal. If, in the opinion of the Design Professional, the extent of the reaming is such that holes cannot be properly filled or accurately adjusted after reaming, the faulty member shall be discarded and replaced with a new one, and all costs and expenses resulting shall be paid by the Contactor.
- H. No cutting of sections, either flanges, webs, stems or angles, shall be done by the Contractor without the consent of the Design Professional, unless this cutting is particularly specified or shown on the drawings.
- I. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions
- J. Corrective Measures

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1. Any errors in locations or inaccuracies in the setting of anchor bolts, base plates, bearing plates, or other items of attachment or support for steel work shall be reported to the Design Professional, and shall be corrected in a manner subject to the approval of the Design Professional.
  2. Any misfits due to errors in fabrication shall be reported immediately to the Design Professional, along with proposed method of correction of same and Design Professional approval obtained before proceeding with corrective measures.
  3. No members shall be cut or burned without specific approval in writing.
  4. Bolted or welded connections, joints, or fastenings, which are classified as defective in the opinion of the Design Professional, shall be corrected by the Contractor in a manner subject to the Design Professional's approval.

### **3.04 FIELD CONNECTIONS**

- A. High-Strength Bolts: Install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt and joint type specified.
  1. Joint Type: Snug tightened.
  2. Install lock washers and/or double nuts at each bolted connection to prevent the bolts from loosening over time.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
  1. Comply with ANSI/AISC 303 and ANSI/AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
  2. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
  3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in ANSI/AISC 303 for mill material.
- C. Erection Connections, etc.: Place holes, plates, or other attachments required by the Erector so as not to interfere with or cause any other detrimental effect to structural members or their connections.
- D. Field Connections shall be Field Coated with zinc rich galvanizing repair paint to create a continuous corrosion resistant surface over and between connections and structural framing members.

### **3.05 REPAIR**

- A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing, and repair galvanizing to comply with ASTM A780/A780M.

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**3.06 FIELD QUALITY CONTROL**

- A. Special Inspections: Owner will engage a special inspector to perform the following special inspections:
  - 1. Verify structural-steel materials and inspect steel frame joint details.
  - 2. Verify weld materials and inspect welds.
  - 3. Verify connection materials and inspect high-strength bolted connections.
  
- B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
  - 1. Bolted Connections: Inspect bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
  - 2. Welded Connections: Visually inspect field welds in accordance with AWS D1.1/D1.1M.
    - a. In addition to visual inspection, test and inspect field welds in accordance with AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
      - 1) Liquid Penetrant Inspection: ASTM E165/E165M.
      - 2) Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
      - 3) Ultrasonic Inspection: ASTM E164.
      - 4) Radiographic Inspection: ASTM E94/E94M.
  - 3. Shear Stud Connectors: In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:
    - a. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
    - b. Conduct tests according to requirements in AWS D1.1/D1.1M on additional shear connectors if weld fracture occurs on shear connectors already tested.

**END OF SECTION**

**SECTION 05 50 00  
METAL FABRICATIONS**

**PART 1 – GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. Work under this section includes fabrication and installation of miscellaneous metal items including, but not limited to, pipe supports, pipe hangers, clamps, brackets, frames, and associated anchorages.

**1.02 QUALITY ASSURANCE**

- A. General
  - 1. Shop and field welding shall conform to the requirements of the American Institute of Steel Construction or the Aluminum Association, as applicable.
  - 2. The use of salvaged, reprocessed or scrap materials will not be permitted.
  - 3. Stainless steel components exposed to exterior or waterfront conditions shall be suitable for continuous wet service and splash-zone exposure.
- B. References
  - 1. This section contains references to the following documents. They are part of this section as specified and modified. Where a referenced document contains references to other standards, those documents are included as references under this section as if referenced directly. In the event of conflict between the requirements of this section and those of the listed documents, contact the Design Professional.
    - a. AISC Steel Construction Manual – American Institute of Steel Construction, Steel Construction Manual, 15th Edition
    - b. Aluminum Design Manual – The Aluminum Association, Aluminum Design Manual with Specifications and Guidelines, 2020
    - c. ASTM A36 – Carbon Structural Steel
    - d. ASTM A148 – Standard Specification for Steel Castings, High Strength, for Structural Purposes
    - e. ASTM A193 – Alloy-Steel and Stainless Steel Bolting Materials for High Temperature or High Pressure Service and Other Special Purpose Applications
    - f. ASTM A194 – Carbon and Alloy Steel Nuts for Washers for High Pressure or High Temperature Service
    - g. ASTM A240 – Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels and for General Applications

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- h. ASTM A276 – Stainless Steel Bars and Shapes
  - i. ASTM A307 – Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength
  - j. ASTM A325 – Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
  - k. ASTM A380 – Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems
  - l. ASTM B209 – Aluminum and Aluminum-Alloy Sheet and Plate
  - m. ASTM B241 – Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube
  - n. ASTM B308 – Aluminum-Alloy Standard Structural Shapes, Rolled or Extruded
  - o. AWS D1.6 – Structural Welding Code-Stainless Steel

### **1.03 SUBMITTALS**

- A. Shop drawings and product data containing the following information:
  - 1. Erection views, plans, elevations, sections, and details of completed assemblies including connection hardware.
  - 2. Detail drawings of fabricated pieces, including sections, size and thicknesses, material proposed for use, dimensions, camber, and welds.
  - 3. Complete structural properties for similar sections and hardware proposed to substitute for those indicated on the drawings or specified herein.

## **PART 2 – PRODUCTS**

### **2.01 MATERIALS**

- A. Materials for miscellaneous metalwork are as follows:
  - 1. Steel bars, angles, clips, and similar items – ASTM A36
  - 2. Structural steel tubing – ASTM A500, Grade B
  - 3. Steel bolts – ASTM A307, Grade A or ASTM A325 (Type 1)
  - 4. Stainless steel bolts – ASTM A193, Grade B8M Class 1, AISI 316 or ASTM A320, Grade B8M Class 1, AISI 316
  - 5. Stainless steel nuts and washers – ASTM A194 Grade 8M, SS316
  - 6. Stainless steel bars and shapes – ASTM A276, Type 316
  - 7. Stainless steel plate – ASTM A240, Type 316
  - 8. Aluminum structural shapes – ASTM B308, 6061-T6
  - 9. Aluminum pipe and tubing – ASTM B241, 6061-T6
  - 10. Aluminum plates – ASTM B209, 6061-T6

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**2.02 FABRICATION**

- A. General
  - 1. Conform to the American Institute of Steel Construction or the Aluminum Association standards as applicable. Where Code defined loads apply, also conform to IBC requirements.
  - 2. Holes shall be punched 1/16 inch larger than the nominal size of the bolts, unless otherwise specified. Whenever needed, because of the thickness of the metal, holes shall be subpunched and reamed or shall be drilled.
  - 3. Fabrication including cutting, drilling, punching, threading and tapping required for miscellaneous metal or adjacent work shall be performed prior to hot-dip galvanizing.
- B. Seat Angles, Supports, Guides and Brackets
  - 1. Seat angles, clips, guides, and brackets for grating, floor plate supports, or similar shall be stainless steel unless otherwise specified.
- C. Pipe supports, hangers, clamps, brackets, fasteners, and other miscellaneous metal fabrications exposed to exterior, waterfront, or wet-service conditions shall be fabricated from Type 316 stainless steel, unless otherwise indicated on the Drawings.

**PART 3 – EXECUTION**

**3.01 INSTALLATION**

- A. General
  - 1. Dissimilar metals shall be protected from galvanic corrosion by means of pressure tapes, coatings, or isolators.
- B. Seat Angles, Supports, Guides and Brackets
  - 1. Seat angles for grating and supports for floor plates shall be set so that they are flush with the floor and maintain the grating and floor plates flush with the floor.

**3.02 FINISHES**

- A. Fabricated metalwork shall be finished according to the following:
  - 1. Steel fabrications and hardware – Hot dip galvanized
  - 2. Aluminum fabrications – Anodized finish
  - 3. Stainless steel fabrications and hardware – Mill finish, pickled and passivated per ASTM A380

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**3.03 CLEANING**

- A. After installation, damaged surfaces of shop primed metals shall be cleaned and touched up with the same material used for the shop coat.
- B. Damaged surfaces of galvanized metals shall be cleaned where galvanizing is damaged or missing and repaired in compliance with ASTM A780/A780M.
- C. All surfaces shall be properly cleaned or prepared for finishing if specified elsewhere.

**END OF SECTION**

**SECTION 05 52 00**  
**METAL RAILINGS**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. General: Furnish all labor equipment and materials necessary for the provision and installation of steel pipe handrails for stairs and ramps.
- B. Although not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances, and devices incidental to complete installation.

**1.02 REFERENCES**

- A. General
  - 1. The Contractor shall comply with provisions of all local, state, and federal codes, specifications, standards, and recommended practices.
- B. ASTM International (ASTM)
  - 1. ASTM A53/A53M, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
  - 2. ASTM A123/A123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
  - 3. ASTM A153/A153M, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
  - 4. ASTM D6386, Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting
  - 5. ASTM E488, Standard Test Methods for Strength of Anchors in Concrete Elements
  - 6. ASTM F436, Standard Specification for Hardened Steel Washers
- C. American Welding Society (AWS)
  - 1. AWS A2.4, Standard Symbols for Welding, Brazing, and Nondestructive Examination

**1.03 SUBMITTALS**

- A. General: Submit the following information on a schedule allowing for minimum 10 working day review/approval prior to placing order.
- B. Shop Drawings:
  - 1. Handrail at stairs
  - 2. Handrail at ramps



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- 3. Shop Drawings shall include plans, elevations, and sections as needed to fully describe the specified item and its installation including materials, finishes, sizes and dimensions. Show relationship to adjacent related work with accurate field dimensions as required. Indicate where sections adjoin, mounting, concrete mix/grouting requirements and reinforcing as applicable. Include all components and hardware.
  - 4. The Contractor shall field verify dimensions and provide an accurate, scaled Shop Drawing of the handrail layout for review and approval prior to beginning construction. The Shop Drawing shall provide accurate dimensions for distances between handrail posts and at all corners. Posts will not be set on corners but offset in each direction to form a uniform corner rail module that will be replicated throughout the project.
- C. Product Data:
- 1. Provide the fabricator's and/or manufacturer's product data and installation instructions for all items in this section. Include powder coat touch-up product and procedures and grout.
  - 2. Provide color and options for submittal review and approval.
  - 3. Provide a sample for review and approval.
- D. Warranty: Submit warranties for metalwork with product submittals.

#### **1.04 QUALITY ASSURANCE**

- A. Installer Qualifications: The Contractor and fabricators must have 3 to 5 years of experience in work of a similar nature, must have adequate facilities and personnel for indicated work, and must be acquainted with all the work related to this section and any other work that might affect preparation for installation of this work.
- B. Welding: Qualify procedures and personnel according to the following:
- 1. AWS D1.1: Structural Welding Code – Steel
  - 2. AWS D1.3: Structural Welding Code – Sheet Steel
  - 3. AWS D1.6: Structural Welding Code – Stainless Steel
- C. Metal fabrications work shall be stored on blocking so that no metal touches the ground and water cannot collect thereon. The material shall be protected against bending under its own weight or superimposed loads.
- D. Before assembly, surfaces to be in contact with each other shall be thoroughly cleaned. All parts shall be assembled accurately as indicated on the Drawings and Shop Drawings. Light drifting will be permitted to draw parts together, but drifting to match unfair holes will not be permitted. Any enlargement of holes necessary to make connections in the field shall be done by reaming with twist drills, subject to approval of the Owner's Representative. Enlarging holes by burning will not be permitted.

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- E. Use of salvage, reprocessed, or scrap materials will not be permitted.

**1.05 WARRANTY**

- A. Coverage: The Warranty shall protect the Owner from all installation, manufacturing, and material defects related to work in this section.
- B. Conditions: The warranty shall ensure prompt repair or replacement of work that does not perform as required because of failures in workmanship and materials. The repairs/replacement shall be made by the warrantor within 20 days of receipt of a complaint in writing, except if adverse weather conditions prevent it. The warranty shall guarantee work in this section for a period of 1 year from the date of final acceptance of the entire project by the Owner. The powder coat finish warranty shall explicitly state an extended 15-year warranty.
- C. Warrantor: The warranty shall be promulgated by the parent company of the installer and shall be signed by an authorized individual in the parent company.

**1.06 PROJECT CONDITIONS**

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication and indicate measurements on the Shop Drawings.
1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating metal fabrications without field measurements. Coordinate wall and other contiguous construction to ensure that actual dimensions correspond to established dimensions.
  2. Provide allowance for trimming and fitting at the site.
  3. Provide nondestructive testing to locate reinforcing bars in concrete so that drilling for post-installed anchors does not hit reinforcing.

**1.07 COORDINATION**

- A. Coordinate installation of anchorages for metal fabrications. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors that are to be embedded in concrete or masonry. Deliver such items to the Project site in time for installation.
- B. Coordinate installation of steel weld plates and angles for casting into concrete that are specified in this section but required for work of another section. Deliver such items to the Project site in time for installation.
- C. Coordinate placement of reinforcing bars so that anchorage for metal fabrications can be located as shown on the Drawings.

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- D. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating per the manufacturers' written recommendations to ensure shop primers and topcoats are compatible.

## **PART 2 – PRODUCTS**

### **2.01 GENERAL**

- A. Metal surfaces: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

### **2.02 MATERIALS**

- A. Provide handrail materials and sizes as indicated and per approved Shop Drawings.
- B. All carbon steel products and fabrications shall be hot-dip galvanized after fabrication per ASTM A123 unless noted otherwise or supplied with an acceptable factory finish.
- C. Steel plates, shapes, and bars: ASTM A36/A36M
- D. Steel tubing: ASTM A500 Grade B and ASTM A501
- E. Pipe: ASTM A53/A53M Grade B Schedule 40
- F. Bolts: A307 galvanized to A153
- G. Nuts and Washers: ASTM A563 and F436, galvanized to ASTM A153/A153M
- H. Welding materials: AWS D1.1 (type required for materials being welded)
- I. Shop and touch-up primer: SSPC-Paint 15, complying with volatile organic compound (VOC) limitations of authorities having jurisdiction
- J. Touch-up primer for galvanized surfaces: SSPC-Paint 20, Type I – Inorganic, complying with VOC limitations of authorities having jurisdiction.
- K. Concrete reinforcement and footings: Per Section 03 30 00 – Cast-In-Place Concrete.

### **2.03 MISCELLANEOUS FRAMING AND SUPPORTS**

- A. General: Provide steel framing and supports not specified in other sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction retained by framing and supports. Cut, drill, and tap units to receive hardware, hangers, and similar items.
- C. All miscellaneous framing and supports shall be hot-dip galvanized unless otherwise noted.
- D. Provide minimum 3/16-inch fillet welds or slot welds with smooth ground surface where no other welds are indicated.

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**2.04 MISCELLANEOUS STEEL TRIM**

- A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.
- B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
- C. Provide integrally welded steel strap anchors for embedding in concrete or masonry construction.
- D. All miscellaneous framing and supports shall be hot-dip galvanized unless otherwise noted.

**2.05 MISCELLANEOUS FASTENERS**

- A. General: Unless otherwise indicated, provide stainless-steel fasteners. Select fasteners for type, grade, and class required.
- B. Anchor bolts: ASTM F1554, Grade 36, hot-dip galvanize per ASTM A153
- C. Eyebolts: ASTM A489
- D. Machine screws: ASME B18.6.3
- E. Lag bolts: ASME B18.2.1
- F. Plain washers: Round, ASME B18.22.1
- G. Lock washers: Helical, spring type, ASME B18.21.1
- H. Cast-in-place anchors in concrete: Anchors capable of sustaining, without failure, a load equal to four times the load imposed, as determined by testing according to ASTM E488, conducted by a qualified independent testing agency.
- I. Post-installed concrete anchors
  - 1. Adhesive anchors in concrete: Adhesive anchors shall be tested and approved for use in cracked or uncracked concrete and for prolonged tension loads. Acceptable products are HIT-HY200 by Hilti, SET-XP by Simpson Strongtie Inc., or Owner's Representative-approved equivalent. Use standard embedment depth unless noted otherwise.
  - 2. Expansion anchors in concrete: Expansion anchors shall be tested and approved for use in cracked or uncracked concrete and for prolonged tension loads. Acceptable products are Kwik Bolt TZ by Hilti, Strong-bolt 2 by Simpson Strongtie Inc., or Owner's Representative-approved equivalent. Use standard embedment unless noted otherwise.
  - 3. All post-installed concrete anchor bolts shall be type 304 stainless steel unless noted otherwise.
  - 4. Locate rebar by nondestructive means before drilling holes for concrete anchor installation.
  - 5. Embedment shall be 10 diameters unless noted otherwise on the Drawings.

- J. Post-installed masonry anchors
  - 1. Expansion anchors in grouted masonry: Shall be KwikBolt 3 by Hilti, Strong Bolt 2 by Simpson Strongtie, or approved equivalent.
  - 2. Expansion anchors in hollow masonry block: Shall be HLC sleeve anchor by Hilti or Owner's Representative-approved equivalent.
  - 3. All post-installed concrete masonry anchor bolts shall be type 304 stainless steel.
- K. Powder-actuated fasteners
  - 1. Powder actuated fasteners shall be stainless steel, unless noted otherwise. Length and type of fasteners shall be suitable for attaching wood or steel to concrete, as shown on the Drawings. Minimum shank diameter is 0.145 inch.
  - 2. Fasteners shall not be installed until concrete is at least 7 days old.

## **2.06 MISCELLANEOUS MATERIALS**

- A. Galvanizing repair paint: High-zinc-dust-content paint for re-galvanizing welds in steel, complying with SSPC-Paint 20
- B. Bituminous paint: Cold-applied asphalt emulsion complying with ASTM D1187
- C. Non-shrink, nonmetallic grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107. Provide grout specifically recommended by the manufacturer for interior and exterior applications.

## **2.07 FABRICATION**

- A. Verify all dimensions and fabricate to detail with accurate sizes and shapes, straight lines, and sharp angles.
- B. Welds shall have sufficient strength to withstand the loads applied. All welds shall be continuous. Grind all welds smooth and flush.
- C. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain the structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- D. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch, unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- E. Form bent-metal corners to the smallest radius possible without causing grain separation or otherwise impairing work.
- F. Form exposed work true to line and level with accurate angles and surfaces and straight edges.
- G. Weld corners and seams continuously to comply with the following:

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- 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and that the contour of the welded surface matches that of the adjacent surface.
- H. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use flat (countersunk) Phillips-head screws or bolts, unless otherwise indicated. Locate joints where they will be least conspicuous.
- I. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weepholes where water may accumulate.
- J. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- K. Close all hollow sections and pipe with end plates and seal airtight with welds. Where fabrications are to be hot-dip galvanized, provide vent holes in inconspicuous locations and seal with mastic after treatment.
- L. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
- 1. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches, with a minimum 6-inch embedment and 2-inch hook not less than 8 inches from ends and corners of units and 24 inches on center, unless otherwise indicated.

## **2.08 SURFACE PREPARATION FOR SHOP-PRIMED FINISHES**

- A. Treatment for galvanized steel to receive paint: Conform to ASTM D6386 for preparation of galvanized surfaces prior to application of shop primers and other coatings directly to galvanized surfaces.
- 1. Newly galvanized steel: Within 48 hours of galvanizing, and before zinc oxide or zinc hydroxide forms on the surface, clean the surfaces of oil and grease. Smooth high spots and rough edges by sanding or sweep blasting. Apply zinc-phosphate treatment or other acceptable adhesion promoter.
  - 2. Do not apply alkyd primers or coatings directly to galvanized surfaces.

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**2.09 FINISHES**

- A. Comply with the National Association of Architectural Metal Manufacturer's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish metal fabrications after assembly.
- C. Galvanizing: Hot-dip galvanize to comply with ASTM A123/A123M.
  - 1. Hot-dip galvanize steel and iron hardware to comply with ASTM A153/A153M.
- D. Powder-coat finish: Prepare, treat, and coat ferrous metal to comply with resin manufacturer's written instructions.
  - 1. Preparation of Uncoated Ferrous Metal: Comply with SSPC-SP 6: Commercial Blast Cleaning.
  - 2. Treat prepared metal with metallic-phosphate pretreatment, rinse, and seal surfaces.
  - 3. Apply thermosetting polyester or acrylic urethane powder coating with cured-film thickness not less than 1.5 mils.
  - 4. Color: Match sample. The color of the guardrails shall be matte black as approved.
- E. Finishes: Aluminum
  - 1. Exterior aluminum surfaces: Class I natural anodized
  - 2. Comply with American National Standards Institute AA DAF-45 for aluminum finishes required.
  - 3. Class I natural anodized finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7-mil (0.018-mm) thick.
  - 4. Apply one coat of bituminous paint to concealed aluminum surfaces in contact with cementitious or dissimilar materials.
- F. Coordination:
  - 1. Use the same primer for touch-up for damaged galvanized surfaces to be painted.
  - 2. Steel embedded in concrete is not required to be primed, except the portion projecting from concrete and the first 3 inches of embedment.
- G. Field Paint (Top Coats): per Section 09 90 00 – Painting and Coating

**PART 3 – EXECUTION**

**3.01 INSTALLATION, GENERAL**

- A. General: Prior to fabrication, field verify all dimensions comply with the Drawings and are code compliant. Install handrails plumb and true in locations indicated, per approved Shop

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Drawings and manufacturer's directions. Secure in concrete per detail and specifications and as approved.

- B. Shop assemble in the largest subassemblies practical to keep field welding to a minimum. Butt weld joints together except for long runs (40 feet maximum), which are to be fabricated with smaller-diameter slip-joint inserts to accommodate movement. Cap all open ends. Zinc coat prior to powder coating.
- C. Welding: All welds shall be continuous runs. Grind welds smooth and paint with zinc prior to powder coating. Protect adjacent surfaces from damage. The Owner's Representative reserves the right to test welds to determine their quality.
- D. Bends: Use jigs to make similar bends the same. Bends shall be neat without other deformation.
- E. Cutting, fitting, and placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation, with edges and surfaces level, plumb, true, and free of rack and measured from established lines and levels.
- F. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- G. Field welding: Comply with the following requirements:
  - 1. Perform field welding in accordance with AWS D1.1.
  - 2. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 3. Obtain fusion without undercut or overlap.
  - 4. Remove welding flux immediately.
  - 5. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and so the contour of welded surface matches that of the adjacent surface.
- H. Fastening to in-place construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.
- I. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- J. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.
- K. Provide anti-seize compound on all stainless-steel threaded connections.



**3.02 PREPARATION**

- A. Clean and strip primed steel items to bare metal where site welding is required. Supply setting templates to the appropriate entities for steel items required to be cast into concrete.

**3.03 ADJUSTING AND CLEANING**

- A. Touch up powder-coat finish: Immediately after erection, clean field welds, bolted connections, and abraded areas. Resurface uncoated and abraded areas with product specifically intended for touching up factory powder coating, as recommended by the manufacturer.
- B. Galvanized surfaces: Clean field welds, bolted connections, and abraded areas, and repair galvanizing to comply with ASTM A780.

**END OF SECTION**

**SECTION 05 60 00**  
**ALUMINUM GANGWAY**

**PART 1 – GENERAL**

**1.01 RELATED WORK SPECIFIED ELSEWHERE**

- A. The provisions and intent of the contract, including the General Conditions, Supplementary Conditions, and General Requirements, apply to this work as if specified in this section. Work related to this section is described in:
1. Section 05 50 00 – Metal Fabrications
  2. Section 06 74 13 – Fiberglass Reinforced Gratings

**1.02 DESCRIPTION OF WORK**

- A. This section describes the requirements to design, furnish, and install the aluminum gangways and appurtenant features.

**1.03 SUBMITTALS**

- A. Submit the following information:
1. Submit Final Design Calculations demonstrating that the aluminum gangways and appurtenant features conform to all design requirements. Calculations shall bear the seal of a Professional Engineer registered in the State of Washington.
  2. Submit Design Drawings for the aluminum gangway and appurtenant features, showing all materials, member shapes and sizes, dimensions, quantities, connecting details, and accessories. Drawings shall bear the seal of a Professional Engineer registered in the State of Washington.
  3. Submit material certifications per the requirements of Sections 05 50 00 and 06 74 13.

**1.04 DESIGN REQUIREMENTS**

- A. The criteria presented in this Specification are based upon the best estimate of those environmental and physical factors which reasonably can be expected to affect the design, performance, and durability of the aluminum fabrications. Final calculations shall demonstrate the aluminum gangway and appurtenances, using the criteria specified herein as a minimum, are designed to withstand the operational loading and motions without damage. Final design calculations shall be submitted and approved before ordering materials or starting fabrication.

**B. General**

1. The design shall be completed in accordance with the International Building Code, current edition, as amended by the State of Washington and the City of Mercer Island, Washington.
2. The gangway and structural components shall be designed with a minimum safety factor on working stress as specified in AA "Specifications for Aluminum Structures". For non-aluminum structural components, similar safety factors shall apply.
3. The gangway grating shall be provided with an aggressively non-skid surface.
4. The gangway design shall comply with the provisions of the Americans with Disabilities Act.

**C. Design Loads, Stresses, and Deflections**

1. The vertical design load shall be the combination of the dead weight of the structure and either live load Case A or Case B, whichever governs:
  - a. Case A shall be a uniform live load of 100 pounds per square foot of gangway surface area.
  - b. Case B shall be a concentrated live load of 400 pounds applied anywhere on the deck surface within a 12" x 12" area.
2. The minimum horizontal design load shall be a uniform wind load of 25 pounds per square foot of profile area. The horizontal design load shall be applied in combination with the dead weight.
3. The maximum allowable deflection under the vertical governing design live load shall equal the span length divided by 360.
4. Design shall consider stresses resulting from handling and installation.

**PART 2 – PRODUCTS**

**2.01 MATERIALS**

- A. Metallic elements shall comply with the requirements of Section 05 50 00.
- B. FRP grating shall comply with the requirements of Section 06 74 13.

**PART 3 – EXECUTION**

**3.01 WORKMANSHIP**

- A. All work shall conform to the Shop Drawings as reviewed and approved by the Design Professional, project drawings and this specification. Construction details, finishing details and colors shall be consistent throughout. Work shall be accurately set to establish lines and elevations, and securely fastened in place. Cutting, drilling, and punching shall produce clean true lines and surfaces. Exposed surfaces of work shall have a smooth finish.

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Grindings and metal filings from fabrication shall be carefully removed from exposed surfaces prior to the end of each work day to prevent spotting and pitting.

**3.02 WELDING**

- A. Welding shall comply with the requirements of Section 05 50 00.

**3.03 FINISHING**

- A. Deck surfaces of the aluminum structures shall be sandblasted in accordance with Commercial Sand Blast SSPC-SP 6-63, which produces a coarse matte finish.

**3.04 DISSIMILAR METALS**

- A. Care shall be taken to prevent contact between dissimilar metals. Where aluminum is in contact with concrete, wet or pressure-treated wood, or absorptive materials subject to wetting, the aluminum surfaces shall be protected with a coat of bituminous paint to prevent galvanic action.

**3.05 FREEBOARD MEASUREMENT**

- A. The design shall include provisions to measure the freeboard at each corner of the floats prior to commencement of construction. The method chosen shall have a demonstrated precision of +/- 1/8 inches. The freeboard shall be measured again after the gangway elements have been installed and the float is clear of construction equipment to verify compliance with the freeboard design criteria.

**END OF SECTION**

**SECTION 05 73 16**  
**WIRE ROPE DECORATIVE RAILINGS**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. Section includes:
  - 1. Custom cable railing systems for exterior and interior guardrails, including stainless steel posts, components, cables and fittings, as indicated.
  - 2. Hardwood top rail and handrail as indicated.
  - 3. Accessories as required for a complete installation.
- B. Related Sections:
  - 1. Section 05 50 00 - Metal Fabrications

**1.02 REFERENCES**

- A. Reference Standards: Applicable provisions of the most recent adopted editions of the following standards shall apply to the work of this Section:

Accessible Design	2010 Standards for Accessible Design (ADA)
ASCE 7	Minimum Design Loads for Buildings and Other Structures
ASTM	Standards indicated herein
AWS D Series	Structural Welding Code
NAAMM-AMP 555	Code of Standard Practice for the Architectural Metal Industry
NAAMM	Standards and Manuals for Architectural and Metal Products
NOMMA	National Ornamental & Miscellaneous Metal Association Guideline 1: Voluntary Joint Finish Standards
SSPC	Volume 1, Good Painting Practice, and Volume 2, Systems and Specifications
IBC	International Building Code, with City of Mercer Island amendments

**1.03 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate requirements of substrates, anchorage, flashings, finishes and the like required for complete installation of railings.
  - 2. Coordinate Shop Drawings with concrete paving, concrete reinforcing, and wood rail.

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**1.04 SUBMITTALS**

- A. Submit in accordance with Sections 01 33 00, Submittal Procedures:
  - 1. Product Data: For each railing component indicated.
  - 2. Shop Drawings: Show dimensions, sizes, thicknesses, gauges, finishes, anchorage joining methods, and fabrication details.
    - a. Include erection, reinforcement, embedment details and other information.
  - 3. Engineering Calculations: Delegated design shop drawings and calculations shall be stamped by a qualified professional engineer licensed in the State of Washington.
  - 4. Samples of typical section of system assemblies:
    - a. 12 inch length of each cable rail, post and component in material and finish specified.
    - b. Brackets and accessories, one of each type.
    - c. Hardwood Rails: 12 inch length of each, in material and finish specified.
  - 5. Certificates: Manufacturer's letter certifying that specifications have been followed, including specified shop finish procedures.
  - 6. Qualifications Data: for manufacturer and installer.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Shall have a minimum of 5 years of experience in the detailing and fabrication of railings of quality and type specified in this Section.
- B. Installer Qualifications: Shall have a minimum of 5 years of experience in the installation of railings of quality and type specified in this section.
- C. Quality of Workmanship (exposed steel): Comply with NAAMM Standards indicated.
  - 1. NAAMM Class 1 (Architectural Metals):
    - a. Exposed surfaces are finished smooth with pits, mill marks, nicks and scratches filled or ground off. Defects should not show when painted or polished.
    - b. Welds should be concealed where possible. Exposed welds are ground to small radius with uniform sized cove unless otherwise noted.
    - c. Distortions should not be visible to the eye.
    - d. Exposed joints are fitted to a hairline finish.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with Section 01 60 00, Product Requirements, and following:
  - 1. Delivery: Protectively wrap and package. Verify undamaged condition at site.
  - 2. Storage: Store in warm, dry location and store carefully to prevent damage.
  - 3. Handling: Protect from abuse or misuse at all times. Bent, scratched, or otherwise damaged items will not be accepted.

**1.07 PROJECT SITE CONDITIONS**

- A. Field Measurements: Verify dimensions of supporting structures and conditions at the project site and adjust final Shop Drawings to reflect actual field dimensions.

**1.08 WARRANTY**

- A. Provide warranties in accordance with Section 01 77 00 Closeout Procedures, Section 01 78 36 Warranties, and following:
  - 1. Special Product Warranty: Installer's 2-year warranty against failure including failure of cable tensioning.

**PART 2 – PRODUCTS**

**2.01 PERFORMANCE**

- A. Regulatory Requirements:
  - 1. Comply with IBC and ASCE 7.
  - 2. Seismic: Railings shall be capable of withstanding the effects of earthquake motions determined in accordance with IBC.
  - 3. Accessibility: Comply with 2010 Standards for Accessible Design (ADA) and A117.1.
- B. Design Requirements:
  - 1. Delegated Design: Engage a qualified professional engineer licensed in the State of Washington to provide engineering calculations and shop drawings, for wire rope railings and imposed loads meeting criteria indicated.
  - 2. Railings shall transfer lateral loads into supporting structure without inducing torsion or bending.
  - 3. Allow for thermal movement; maximum temperature range 120 deg F ambient, and 180 deg F material surfaces.
- C. Structural Performance Requirements:
  - 1. Handrails and Guards: Meet or exceed IBC Chapter 10 and 16. Design and fabricate handrail and guard assemblies to meet or exceed the following:
    - a. Resist a linear load of 50 pounds per linear foot, per ASCE 7, Section 4.5.1.1.
    - b. Resist a concentrated load of 200 pounds, per ASCE 7, Section 4.5.1.
    - c. Intermediate Posts and Infill: Design to resist concentrated load of 50 pounds, per ASCE, Section 4.5.1.2.
      - 1) End Posts: Shall be able to support the minimum of the cable tension, or 350 pounds per the number of cables.
  - 2. Loads not assumed to act concurrently.

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**2.02 MANUFACTURERS – CABLE GUARDRAIL SYSTEMS**

- A. Manufacturers:
  - 1. American Metal Specialties, Inc.
  - 2. C. Sherman Johnson Co, Inc. (C.S. Johnson).
  - 3. Feeney Stainless Steel Cable Rail.
  - 4. Ultra-Tec.
  - 5. ViewRail.
  - 6. Or approved.
- B. Product: Basis of Design: ViewRail systems and components indicated.
- C. Submit substitution requests in accordance with Section 01 25 00, Substitution Procedures. Include samples of cable rail components.

**2.03 CABLE GUARDRAIL SYSTEMS**

- A. Cable Guardrail System: ViewRail “Signature” Cable Rail System.
  - 1. Description: Custom, field adjustable system, including post supports and requirements, and performance requirements indicated.
  - 2. Configure guardrail and assemblies as indicated on Drawings.
  - 3. Posts: 2 inch square stainless steel tubes with base plates for surface mounting to concrete, wall thickness as required to meet or exceed performance requirements, powder coat finished in “Jet Black”.
  - 4. Cable:
    - a. Type 316 stainless steel.
    - b. Size: 1 x 19, 5/32 inch stainless steel.
    - c. Cable Tension: 150 pounds.
    - d. Breaking Load Limit: 2,000 pounds.
  - 5. Fittings: Manufacturer’s “Installation Kits” with capability to sustain, without failure, a load equal to minimum breaking strength of wire rope with which they are used.
    - a. Kits as required for railing conditions indicated on Drawings.
      - 1) Level Tension Kit to Level Tension Kit;
      - 2) Inside Post Mount to Level Tension Kit;
      - 3) Angle Tension Kit to Angle Tension Kit;
      - 4) Inside Post to Angle Tension Kit.
  - 6. Top Rails: ViewRail “6001 Ipe Handrail”.
  - 7. Brackets:
    - a. Top Rail: Flat Top Bracket and Universal Bracket.
  - 8. Fasteners and Anchors: Material recommended by manufacturer, designed for intended use and function, and compatible with contacting materials.



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- B. Cable Rail System Accessories: Plugs, post levelers, foam inserts, shims, and other accessories as required for a complete installation.
  - C. Equipment: Installation equipment as recommended by cable railing manufacturer.

#### **2.04 MATERIALS**

- A. Stainless Steel: Type 304.
- B. Hardwood: Ipe hardwood, kiln dried, moisture content 10-18 percent at time of delivery. Top rail surfaces eased on four sides (E4E).
  - 1. Size and Configuration: As indicated on Drawings.
- C. Miscellaneous Items: Provide other materials and items required to complete the work.

#### **2.05 ACCESSORIES**

- A. Anchors, Brackets, and Plates: As required for securing railings to concrete paving. Refer to Drawings.
- B. Fasteners: As determined by engineering calculations, and as recommended by manufacturer for conditions of installation.
- C. Miscellaneous Cable Rail System Accessories: Plugs, post levelers, foam inserts, shims, and as required for a complete installation.
- D. Equipment: Installation equipment as recommended by cable railing manufacturer.

#### **2.06 FABRICATION**

- A. General - Railing:
  - 1. Fabricate structural quality pre-assembled railing systems indicated.
  - 2. Provide continuous runs in largest practical size for delivery to site.
  - 3. Fabricate to true lines; comply with design, dimensions and details indicated, but not less than that required to support structural loads.
  - 4. Welded Connections: Weld all around at connections including at base plates, and grind smooth.
  - 5. Fabricate components with joints tightly fitted and secured.
  - 6. Allow for expansion and contraction.
  - 7. Accurately form railing components to suit building structure.
  - 8. Drilled Holes; Drilled and Tapped Holes: Drill prior to finishing.
- B. Wood Railings:
  - 1. Fabricate hardwood top rail to dimensions and configuration indicated, with mitered corners, eased edges, and finish indicated.

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**2.07 FINISHES**

- A. Stainless Steel: Do not prime or paint stainless steel cables. Posts, brackets, and base mounting plates shall be powder coated in "Jet Black".
- B. Ipe Hardwood: No finish.

**PART 3 – EXECUTION**

**3.01 EXAMINATION**

- A. Verify installation conditions as satisfactory to receive work of this Section.
  - 1. Verify that proper structural support is in place, including brackets for attachment of railings to edge of existing concrete roof and edge of interior mezzanine slab.
- B. Do not install until unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions as satisfactory.

**3.02 PREPARATION**

- A. Supply items required to be cast into concrete, and anchored through concrete or structure, with setting templates, to appropriate Section.

**3.03 INSTALLATION**

- A. Installation - General: Install in accordance with manufacturer's installation instructions and provisions of the Contract Documents including structural performance requirements.
  - 1. Do not install damaged components.
  - 2. Erect assemblies plumb, true to line, in location and elevation indicated on Drawings.
  - 3. Perform field welding only where approved by Owner and Design Professional.
  - 4. Secure systems at slab edges as indicated; coordinate with roofing installation.
  - 5. Allow for expansion and contraction.
- B. Cable Railings: Install in accordance with manufacturer's recommendations, using manufacturer provided cables, fittings, and hardware, within post system meeting structural requirements determined by delegated design.
  - 1. Terminate and tension cables as recommended by cable fittings manufacturer.
  - 2. Tension cables to the amount, in sequence, as recommended by manufacturer.
  - 3. Cables shall be parallel and without kinks.
  - 4. Allow for expansion and contraction.
  - 5. Reposition any misaligned units.
- C. Dissimilar Materials: Protect against galvanic action from uncoated dissimilar materials.

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1. Except as otherwise indicated, embed (uncoated portion) of steel items into concrete and any steel inserts with non-metallic grout.

**3.04 CLEANING AND REPAIR**

- A. Clean exposed surfaces in accordance with manufacturer's recommendations.
- B. Repair: Installed Work shall be free of scratches and stains. Repair damaged finishes in accordance with finish coating manufacturer's instructions.
  1. Replace damaged components unable to be repaired to satisfaction of Owner.

**END OF SECTION**

## **DIVISION 06**

# **WOOD, PLASTICS AND COMPOSITES**

**SECTION 06 13 33.61**  
**PILE WRAP AND JACKETING**

**PART 1 – GENERAL**

**1.01 DESCRIPTION OF WORK**

**A. Overview:**

1. This Section specifies the minimum requirements for providing corrosion protection and/or encapsulation by the installation of Pile Wrap and Jacketing System as shown on the Drawings and as described in this Section.
2. The Work includes all labor, materials, tools, and equipment necessary to provide proper surface preparation of the creosote treated timber piles and installation of the Pile Wrap and Jacketing Systems.

**B. General Requirements:**

1. The following items are included in the Work:
  - a. Providing scaffolding, temporary floating platforms, or other means to access the Work.
  - b. Surface preparation including containment.
  - c. Application of primer.
  - d. Standoffs and spacers.
  - e. Installation of outer jacket including any temporary clamps and straps.
  - f. Grouting of the annular space between pile and jacket, full height.
  - g. Finishing top of pile and jacket to prevent water intrusion.
2. The work includes providing the necessary labor, materials, and documentation necessary to meet the minimum requirements described in specifications, drawings, and referenced supplements for a complete installation.
3. The work includes providing all required, consequential, and incidental labor, equipment, and materials necessary for a complete installation, including but not limited to procurement of materials, testing, fabrication, inspection, assembly, delivery, handling, and storage. This work includes associated administrative tasks as required.
4. The following information describes the requirements associated with Pile Wrap and Jacketing System work as a part of this Project but not described in other sections of the specifications.
5. The work includes all work associated with this specification and Related Work sections.

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6. The Contractor shall review the material and installation requirements and verify that they meet or exceed minimum project requirements.

## **1.02 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including Division 1 Sections, apply to this Section.
- B. Section 01 33 00 – Contractor Submittals
- C. Section 01 40 00 – Quality Requirements
- D. Section 01 57 13 – Temporary Erosion and Water Management
- E. Section 01 60 00 – Product Requirements
- F. Section 01 77 00 –Closeout Procedures

## **1.03 REFERENCES**

- A. Standards, Specifications, Recommended Practices, and listed herein are part of this Section to the extent referenced.
- B. The Society for Protective Coatings (SSPC):
  - 1. SSPC Guide 6, Guide for Containing Surface Preparation Debris
  - 2. SSPC SP2, Hand Tool Cleaning
  - 3. SSPC SP3, Power Tool Cleaning
- C. Product Specification References:
  - 1. Denso “SeaShield Series 400” manufacturer’s recommendations and instructions.
  - 2. Five Star Products “PileForm F FRP Pile Rehabilitation Jacket” manufacturer’s recommendations and instructions .
  - 3. Approved “or equal” manufacturer specifications for creosote timber pile application including irregular areas.
  - 4. If there is a difference between the manufacturer’s specification and this Section, the most stringent provision shall apply.

## **1.04 DEFINITIONS**

- A. The terms, "surface preparation," "steel preparation," "preparation work," "prep," "cleaning," and other similar variations of these terms used in the context of Pile Wrap and Jacketing System work generally refer to the steps necessary to prepare a surface for the first application of coating, and include foreign material removal, cleaning, and other preparatory work as described below.
- B. The terms, "pile wrap," "pile jacket," "jacket," "wrap," "reinforced fiberglass pile jacket," and other similar variations of these terms used in the context of Pile Wrap and Jacketing system work generally refer to the work outlined within this Section.

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**1.05 JOB CONDITIONS**

- A. Job conditions and requirements are as described by the provisions of the Contract, this specification section, General and Supplementary Terms and Conditions, Governing Specifications, Codes, and Standards, and applicable Related Work sections.
- B. Surface preparation for and installation of the pile jackets will require containment as much of that work will be over or adjacent to water in an area with large tide variations.
- C. Work area is continuously submerged.
- D. The Work will take place in an active waterfront park facility and require the following:
  - 1. Work over water requires the use of a personal flotation device (PFD)
  - 2. Work on scaffolding requires the use of harnesses and life lines, and all scaffold workers must be trained in fall protection.
  - 3. Work will require installation by dive crews.

**1.06 QUALITY CONTROL**

- A. Contractor's work shall meet the requirements of Section 01 40 00 – Quality Requirements.
- B. Regulatory Requirements
  - 1. In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word "shall" had been substituted for "should" wherever it appears.
  - 2. Interpret references in these publications to the "authority having jurisdiction," or words of similar meaning, to mean the Owner or their designated representative.
- C. Standard Products
  - 1. Provide materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship.
  - 2. Products shall have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year period shall include applications of equipment and materials under similar circumstances and of similar size. The product shall have been on sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 2-year period.
  - 3. Where two or more items of the same class of equipment are required, these items shall be products of a single manufacturer; however, the component parts of the item need not be the products of the same manufacturer unless stated in this section.

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**1.07 SERVICES OF MANUFACTURER'S REPRESENTATIVE**

- A. Contractor shall arrange for a representative of the manufacturer to be on-site during initial installation of pile jacketing and pile wrapping to ensure proper methods, procedures and processes are being followed by the Contractor.

**1.08 SUBMITTALS**

- A. General
  - 1. Submit the following information in addition to and in accordance with the provisions of this Contract, requirements of this section, Section 01 33 00 – Submittal Procedures, General and Supplementary Terms and Conditions, Governing Specifications, Codes, and Standards, and applicable Related Work sections.
  - 2. Acceptance of any submittal by the Design Professional does not relieve the Contractor of the sole responsibility for completing work as defined in contract documents using acceptable materials and procedures.
  - 3. The omission of components, quantities, or properties in submittals may result in the rejection of the submittal.
  - 4. Each of the following submittals shall be submitted to and approved by the Design Professional prior to mobilization. Orders placed prior to Design Professional approval are completed at the sole risk of the Contractor, and may result in rejected material. Rejected material must be replaced at no cost to the Owner.
- B. Qualifications
  - 1. Provide information on previous pile jacketing installation projects of similar scope, performed by the Contractor within the past 5 years. Include contact information for individuals who are Owner representatives that can verify quality of previous work/projects.
- C. Work Plan
  - 1. Provide work plan for installation of pile jacket systems and pile wrapping. Plan shall address sequence, means and methods, and equipment for pile preparation and installation of complete pile jacketing and pile wrapping systems (each type).
- D. Cleaning and Surface Preparation Procedures and Materials
  - 1. Standard materials and procedures to be used by the Contractor as required by these specifications and the manufacturer's recommendations for SSPC-SP2 or SSPC-SP3 surface preparation requirements
- E. Manufacturer's Data



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1. Certifications and product data sheets for all materials to be included or utilized in the installation of the Pile Wrap and Jacketing System.
  2. Data Sheets & Instructions
    - a. Detailed product material specifications
    - b. Installation requirements shall be submitted to the Design Professional for approval and must include the following plus any other information necessary for a complete installation:
      - 1) Surface preparation requirements
      - 2) Mastic application and curing requirements
      - 3) Petrolatum tape top, bottom, overlap, and splice details, as applicable
      - 4) Maximum allowable time between the installation of mastic/petrolatum tape/protective cover
      - 5) Cover installation guidelines, including connection configuration and tightening requirements
      - 6) Cutting requirements for post-installation cover
    - c. Material movement, transport, and storage requirements
    - d. Typical/routine maintenance requirements
    - e. Limitations of use and applicability
    - f. Criteria by which the Pile Wrap and Jacketing System installation is evaluated, including test procedures, success/failure qualifications, and suggested time period between tests.
  3. Manufacturer Oversight and Training
    - a. Training attendance sign-in sheet
    - b. Confirmation of manufacturer's observation and successful installation containing plan locations, elevations, date/time of installation, photographs, and any other information necessary to document a correct installation.
      - 1) This report shall be submitted within 48 hours of installing the first Pile Wrap Protection System elements.
      - 2) Additionally, reflect the above information with respect to locations on as-built drawings or as an attachment to as-built drawings.
- F. Personnel Certifications
1. Labor Certifications
    - a. Surface preparation crew qualifications/certifications.
    - b. Installer qualifications/certifications.
    - c. Cleaning crew qualifications/certifications
  2. Diver Certifications
    - a. Project reference list, including the name and location of the project, references with contact information, number of pile locations protected, range of typical elevations required, and size of piles.

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- b. Proof of Insurance
  - c. Diver qualifications and skills competency of the proposed dive crew members including the following:
    - 1) Current Association of Diving Contractors International (ADCI) card equal or greater than the position in which they are assigned
    - 2) In lieu of 2.c.1, crew members shall be commercially trained at an Association of Commercial Diving Educators (ACDE) accredited school complying with the requirements of ANSI/ACDE-01-1993, "Commercial Diver Training - Minimum Standard." A military diving school meeting the same standards is also acceptable training.
    - 3) In lieu of 2.c.1 and 2.c.2, trained through either field experience or a combination of formal training and field experience. The OSHA diving standard (29-CFR 1910.410) specifies that all dive team members (i.e., divers and support employees involved in diving operations, including the DPIC) must have experience or training in the use of tools, equipment systems, techniques, diving operations and emergency procedures which pertain to their assigned tasks and diving modes (i.e., scuba diving on air, surface supplied diving on air or mixed gas diving). Additionally, dive team members who are exposed to hyperbaric conditions (e.g., diver) or control the exposure of others to hyperbaric conditions (e.g., DPIC or recompression chamber operator) must be trained in diving related physics and physiology. The level of training required by the standard depends upon the particular experience or function an employee fulfills on a dive team, the specific underwater operational tasks being performed and the diving mode to which the employee is assigned.
    - 4) It is specifically noted that completion of the YMCA, PADI, NAUI or other essentially recreational diver training courses without significant additional training, do not meet the OSHA diving standard.
    - 5) Records of all diver or dive team training shall be maintained by the diving company and be available for inspection.
    - 6) Current American Red Cross First Aid and CPR Cards
    - 7) AWS D3.6M:2010 welding certification or equivalent if underwater welding is performed
  - d. Supervisor qualifications, including proof of 5 years in a supervisory role.
- G. Diving Services Deployment Plan
- 1. Work Procedures
  - 2. Schedule
  - 3. Suitable Weather Criteria
  - 4. Communication Plan

- 5. Safety Plan
  - a. Emergency Response Plan
  - b. Local specialty medical providers
  
- H. Delivery, Storage, and Protection
  - 1. Deliver materials in original packages, containers, boxes, or crates bearing the name of the manufacturer, brand, and model. Store all materials and equipment delivered to the construction site to prevent any damage or deterioration resulting from exposure to weather conditions or other potential hazards. Exercise particular care to avoid damaging materials throughout all lifting or handling operations.
  
- I. Shop Drawings
  - 1. Contractor shall submit shop drawings defining the completed structure, connection details, any unique interface conditions, and general seam arrangement for review and approval by the Design Professional. Shop drawings shall confirm the general arrangement shown on the Project Drawings and specifically include:
    - a. Elements in shop drawings shall be shown with respect to grid or bent locations as shown on Contract Documents.
    - b. The drawings shall show the proposed construction in detail.
    - c. Shop drawings shall be approved by the Design Professional prior to the procurement of materials, fabrication of custom construction materials or other preparatory work.
    - d. Top and bottom elevations relative to project datum of each outer jacket to be installed.
  
- J. Inspection and Testing
  - 1. Inspection results indicating that the manufacturer's performance criteria have been satisfied at each location.
  - 2. Dive Inspection Recordings
    - a. A video of each pile jacket installation from its lowest elevation to the top shall be provided.
    - b. All videos shall include audio descriptions or video subtitles that clearly and accurately describe the location of each pile jacket installation.
  - 3. A written record detailing activities in accordance with this Section and Section 01 40 00 – Quality Requirements as applicable.
  - 4. Non-conformities shall be submitted to the Design Professional for review and comment.
  
- K. As-Built Drawings

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- 1. As-built drawings shall be submitted immediately after completion of installation showing the following items. Elevations may be measured using as-built drawings as a benchmark.
    - a. Type of Pile Wrap and Jacketing System
    - b. Type of Coating System
    - c. Top of jacket elevation
    - d. Bottom of jacket elevation
    - e. Manufacturer-observed installation locations
  - L. Certificate of Compliance
    - 1. Contractor shall submit a letter stating that the submitted manufacturer certifications and test reports have been reviewed, and that the materials being furnished for the project are in conformance with the applicable standards, specifications, and project documents.
  - M. Warranty
    - 1. 10-year material warranty guaranteeing that the system will provide corrosion protection to all fully-encapsulated piles.

## **PART 2 – PRODUCTS**

### **2.01 GENERAL REQUIREMENTS**

- A. Contractor shall comply with all written recommendations of the manufacturer regarding installation of the specified system.
- B. The Contractor shall provide all shipping, handling, and storage required to produce the materials, on-site, prior to installation.
- C. Approval of alternate products will be granted subject to the ability of the equivalent product to meet or exceed the minimum characteristics of the identified products with respect to abrasion resistance, case history, corrosion resistance, environmental toxicity, environmental resistance, service life, UV-resistance, temperature resistance, wear profile, serviceability, warranty, and other criteria necessary to demonstrate a quality and equivalent product. The Contractor shall provide all the documentation required for review by the Design Professional.

### **2.02 SUBSTITUTIONS**

- A. Requests for substitution shall include complete description of the product, manufacturer's catalog cuts, and evidence of satisfactory past performance.
- B. A request constitutes a representation that the Contractor:

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1. Has investigated the proposed product and determined that it meets or exceeds the quality and extended performance level of the specified product.
  2. Will provide the same or better warranty for the Substitution as for the specified product.
  3. Will coordinate Substitution installation and make necessary changes which may be required for the Work to be successfully completed with no additional cost to the Owner.
  4. Waives claims for extra costs or time extension, which may subsequently become apparent.
  5. Will reimburse the Owner for review or redesign services associated with re-approval by the Design Professional.
- C. Include the name and contact information of the owner of the property where the product was used successfully.
- D. Substitutions will not be considered when they are indicated or implied on Shop Drawings or product data Submittals without a separate written request for consideration of the Substitution or when acceptance will require revision to the Contract Documents.

## **2.03 MATERIALS**

- A. General
1. All materials shall meet or exceed the minimum requirements listed by the manufacturer's current specifications at the time of bid.
  2. The Pile Wrap and Jacketing System shall be fashioned to the length, flange, web, and end conditions as applicable at each location to the installation requirements described in plans and specifications.
  3. All components of the Pile Wrap and Jacketing System shall be supplied or warranted by a single manufacturer. Combining proprietary products from multiple companies will not be allowed.
  4. Materials specified herein shall not preclude the use of equivalent materials. Equivalent materials shall be submitted to the Design Professional for consideration at least ten (10) working days prior to the Date of Bids.
    - a. Requests for substitution shall include evidence of satisfactory past performance in a similar application and environment, and include the name and contact information of the owner of the property where the Pile Wrap and Jacketing System was used successfully.
    - b. Substitutions will not be considered if they do not contain an outer jacket that has a proven successful performance record of a minimum of 5-years.
    - c. The Contractor shall state in their bid the amount of deduct to use equivalent materials to those specified.

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- B. Specified materials shall be any of the following identified products or equivalent as approved by the Design Professional:
1. Pile Jacket System
    - a. SeaShield Series 400 System: Denso North America, Houston, TX.
    - b. PileForm F System: Five Star Products, Shelton, CT.
  2. The systems will be sized for creosote treated timber piles at locations shown on the Drawings. Pile diameters vary and shall be verified in the field. Generally, pile diameters range from 1'-0" (+/-) at the mudline to 1'-2" (+/-) at the base of pile cap.
  3. Contractor shall confirm sizes prior to ordering materials including variation in existing geometry.
- C. Primer/Paste
1. Primer shall be non-toxic and comprised of saturated petroleum hydrocarbons (petrolatum), inert fillers and passivating agents.
  2. The paste is used to displace moisture, passivate surface oxides, and fill and profile surface imperfections.
- D. Mastics
1. The mastics used within the jackets shall be as recommended by the manufacturer and be comprised of saturated petroleum hydrocarbons (petrolatum), inert fillers, reinforcing fibers and thermal extenders. Variations may contain beads of cellular polymer and flow control additives.
  2. If non-haunch steel elements are encountered that cannot be removed, contact the Design Professional for direction on coating.
  3. Mastics shall be industrial grade, designed for use in the marine environment.
  4. Mastics shall be cold applied and self-supporting for molding around irregular shapes.
  5. Petrolatum mastics shall provide a suitable profile for applying the petrolatum tape.
- E. Marine Tape
1. The tape shall be comprised of a non-woven synthetic fabric carrier, fully-impregnated and coated with a neutral petrolatum-based compound with inert siliceous fillers and corrosion inhibitors.
  2. Tape shall be nontoxic and have a character stable in composition and plasticity over a wide temperature range.
  3. The tape shall be non-hardening and non-cracking with the ability to accommodate vibration and extreme movement of substrate.
  4. Tape shall be highly resistant to mineral acids and alkalis
- F. Pile Jackets

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1. The jackets shall be comprised of High Density Polyethylene (HDPE), or multi-layer urethane coated reinforced polyester or fiber reinforced plastic (FRP) composite material. It shall be new, seamless virgin material. Use of reprocessed resin is prohibited.
    - a. HDPE outer jacket shall be at least 80 mils thick to prevent damage to the underlying tape.
    - b. Reinforced polyester or RFP composite material shall be at least 30 mils thick to prevent damage to the underlying tape.
  2. The sheet shall be uniform throughout, free from dirt, oil and other foreign matter and free from cracks, creases, wrinkles, bubbles, pin-holes and any other defects that may affect its service.
  3. Jackets shall be equipped with a 'flange' type of connection as opposed to a 'hoop' type of connection.
  4. The jackets shall be UV-resistant
  - 5.
- G. Closure Systems / Fasteners
1. As required by the product manufacturer

## **2.04 FABRICATION**

- A. Pile Jacket
1. Pile jackets shall be custom fabricated to meet the installation requirements in the contract documents.
  2. Pile jackets shall be custom fabricated to meet manufacturer tolerances at each pile location. Creosote timber pile dimensions may vary by location.

## **2.05 PRODUCT HANDLING**

- A. All materials shall be protected during shipping and handling.
- B. Materials shall be stored above ground on pallets, platforms or other supports, and be protected from excessive exposure to moisture prior to fabrication/use.
- C. Materials shall be stored and staged out of direct sunlight at temperatures similar to site conditions, and with dunnage, as needed, to reduce the chance of warping.

## **PART 3 – EXECUTION**

### **3.01 PROJECT NOTES**

- A. Site Verification of Conditions

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1. Contractor shall examine areas and conditions under which installation/application of jackets shall be performed for conditions that will adversely affect execution, performance, or quality of the installation including, but not limited to:
    - a. Obstacles to be removed prior to installation
      - 1) Existing temporary scaffolding, formwork, or nails
      - 2) Existing bars or other steel items welded or otherwise fastened to the piles
      - 3) Non-dock supporting timber piles
      - 4) Prior to removal, provide the Design Professional with photographs and locations of all items the Contractor seeks to remove to allow proper installation of the materials or for the Contractor's convenience.
      - 5) Removal of obstacles is considered incidental to the installation of the Pile Wrap and Jacketing and is not a separate pay item.
  2. The Contractor shall immediately notify the Owner's Representative of any conditions that will incur delays in the Work or that cannot be corrected absent a change in the Bid Amount.
- B. Proximity to Public
1. Work is to be completed in close proximity to public spaces including a park. At these locations, an increased sensitivity to noise, smells, material containment, and other stimuli common to the Work is anticipated. Contractor shall employ best management practices to minimize unnecessary effects in public spaces.
    - a. Coating applied to surfaces outside the scope of this contract shall be removed, repaired, or otherwise remedied at no cost to the Owner.
    - b. Localized containment and other assurances may be required at work areas in close proximity to vehicles, buildings, public or Owner personnel, and other objects to prevent air- or waterborne transmission of foreign materials and debris.
- C. Contractor shall comply with all written recommendations of the manufacturer regarding application of the specified system.
- D. At times, it may be the Contractor's preference to install the Pile Wrap and Jacketing System to exceed the minimum installation requirements (i.e. elevations and gap dimensions) as designated on drawings.
1. Unless specifically instructed by the Owner's Representative or Design Professional to do so, any installation in excess of that shown on the Drawings at the Contractor's initiative, shall be conducted at no additional cost to the Owner.



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**3.02 REMOVAL OF OBSTACLES**

- A. Remove identified obstacles, and dispose of same in accordance with the Design Professional approved disposal plan.

**3.03 INSTALLATION GENERAL**

- A. All pile wrap and jacketing systems specified above shall be installed in strict accordance with the manufacturer's recommendations regarding surface preparation and installation of the specified system, and as shown on the Drawings.

**3.04 SURFACE PREPARATION**

- A. General
  - 1. The entire surface of each pile, cross member, and gusset to be jacketed shall be thoroughly cleaned to remove all marine growth, loose rust and paint, and other foreign matter for the entire length to be covered by the Pile Wrap and Jacketing System.
  - 2. The cleaning does not require the removal of surface growths from cavities or other indentations that do not come in contact with the system; but does require removal of all surface projections such as:
    - a. Bolts, welded projections, weld splatter, fouling organisms, organic growth and other surface conditions such as sharp points or edges that would either penetrate the module or cause undue deformation.
  - 3. It shall not be necessary to remove surface bumps or other similar unevenness, provided these are smooth, as the material has sufficient elasticity to pass over these surface defects without interfering with the snugness of the overall length.
  - 4. Remove marine growth, loose rust, paint, and foreign matter by hand and /or power tools cleaning in accordance with SSPC-SP-2, or SP-3, "Hand Tool Cleaning" or "Power Tool Cleaning" respectively.
  - 5. A hydraulic whirl away or high pressure water blaster may be used to prepare the surface provided the prepared surface meets the approval of the Manufacturer's Technical Representative.
- B. Approval of Surface Preparation
  - 1. Obtain the Manufacturer's Technical Representative written approval that the surface preparation is adequate.
    - a. Include photographs that clearly illustrate what is adequate and inadequate surface preparation.
    - b. Provide the Design Professional and Owner's inspector with an electronic copy of the manufacturer's written approval.

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2. Prior to installation of any primer/paste, hold an on-site meeting including the Manufacturer's Technical Representative and the Owner's Representative.
    - a. The purpose of this meeting is to ensure that representatives of the Contractor, manufacturer, and Owner are in full agreement as to what surface conditions are required immediately prior to application of the primer/paste.

### **3.05 PILE JACKET INSTALLATION**

#### **A. Primer/Paste**

1. Do not install any primer/paste until after the surface preparation meeting described above.
2. Apply paste by hand, brush, glove, rag or roller.
3. Apply a thin uniform film over the entire surface to be wrapped with petrolatum tape.
4. A liberal coating shall be applied at cavities, voids, shoulders and other irregularities.
5. The primer/paste shall be stored in accordance with the manufacturer's requirements.
6. Special requirements may apply for underwater application.

#### **B. Mastics**

1. To protect complex surfaces and sharp intersections, apply mastic by filling and packing to achieve a smooth uniform contour to which tape can be applied without bridging or voids.
2. Use mastic to fill cavities and smooth welds, sharp intersections, and other discontinuities at pile/pile cap interfaces.
3. Apply mastic to voids over 1/8" deep.
4. Mastic shall be stored in accordance with the manufacturer's requirements until immediately prior to use.

#### **C. Pile Jacket**

1. General
  - a. Locate the pile jacket between the elevations indicated in the Drawings, and as verified in the field.
  - b. Place the pile jacket tightly around the pile and align the holes and fastener bars.
  - c. Secure in place in accordance with manufacturer recommendations.
2. Joints
  - a. For each pile the extreme top terminus shall be the pile-timber cap (or shim) interface.
  - b. Intermediate joints shall be aligned to be perpendicular to the longitudinal axis of the pile.

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- c. The extreme bottom terminus shall be aligned to be perpendicular to the longitudinal axis of the pile and at the elevation indicated in the Drawings.
  - d. Press adjacent sections as closely as possible, overlapping as required by the manufacturer.
  - e. The joint interface between two butting sections shall be smooth and free of jagged edges.
  - f. Joints shall be plumb to 4:100 of pile longitudinal axis or true level as required by location.
- 3. Length
    - a. Jackets shall be no less than 4'-0" unless the total jacket length is less than 4'-0", or as approved by the Design Professional.
    - b. No joints shall exist within 4' of the pile to pier cap connection interface or any pile splice location.
  - 4. Fitting
    - a. A combination of shop and field fitting is likely required to meet installation tolerances.
    - b. Operations necessary to meet installation tolerances described in contract documents shall be completed at no cost to the Owner.
    - c. Where field cuts are necessary, contractor shall provide templates, grinders, and other means and methods necessary to provide fine adjustments.
    - d. Field cuts shall be smooth and flush, with variations less than 1" longitudinally per transverse foot.
    - e. Field cuts shall be within 2% of plumb when measured from true level or the pile longitudinal axis.
  - 5. Schedule
    - a. Pile jacket shall be installed within 48 hours of marine tape installation or as directed by the manufacturer.
- D. Fasteners
- 1. A washer shall be placed at nut and bolt head each.
  - 2. Manufacturer torque specifications shall apply.
    - a. For installation, torque wrench capable of reading a minimum of 25 in. lb. is required.
  - 3. A thin coat of anti-seize compound shall be applied to bolts prior to tightening to prevent possible galling.
  - 4. Using the specified nuts, bolts, and washers, tighten and secure the pile wrap to the manufacturer's required torque specification.
- E. Obstructions

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1. Large piprap, drift wood, and other objects may be designated as an obstruction if they prohibit the installation of the wrap system to the elevations shown in plans.
  2. Boulders and other debris in the immediate vicinity of piling that render the installation impossible shall be considered obstructions only where the individual debris element weighs over 500 lb.
  3. Obstructions shall be considered field conditions, and may or may not be identified in plans. No additional payment shall be issued due to deviations necessary to complete a wrap system installation at obstructed locations.
  4. Except as noted above, the fill line and/or mudline is not considered an obstruction or obstacle.

**F. Lower Elevations Below Local Grade**

1. Where the Pile Wrap and Jacketing Systems are shown in the Drawings to intersect the fill line and/or mudline, the fill or soil will need to be removed as necessary to allow installation of the Pile Wrap and Jacketing System to an elevation at least 2.0 ft. below the existing grade at the mudline.
2. After installing the Pile Wrap and Jacketing Systems, the CONTRACTOR shall backfill the excavation returning the surface adjacent to the jacket to a grade flush with adjacent areas.

**3.06 QUALITY ASSURANCE**

**A. Manufacturer's Observation, Training, and Inspection**

1. On-site training is required for submerged and non-submerged Pile Wrap and Jacketing System sections prior to installation.
2. Training shall be arranged by the Contractor and administered on-site by a material manufacturer representative and attended by the personnel responsible for the installation, including all diving service providers. All foremen, superintendents, project managers, and other managerial staff must be in attendance. Attendance sheets shall be submitted to the Owner.
3. Compensation, availability, and other logistical arrangements shall be determined and mutually agreed upon by the Contractor and material supplier prior to shipment of materials. Training and observation dates and times must be approved by the Owner.
  - a. Owner's Representative must be present for the training. The training shall be scheduled with as much advance notice as possible, 72 hours minimum.
4. Manufacturer's representative must be present to provide training and observe and approve the installation of pile wrap protection system at two (2) locations at each facility. The representative shall observe the complete installation, including final surface preparatory measures.

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- a. These locations shall be photographed and otherwise documented to serve as a benchmark with which future surface preparation and pile wrap systems will be evaluated.
    - 1) Photographs and other documents shall be reproduced and distributed to the Owner's Representative and the Contractor.
  - b. These locations shall be considered a benchmark by which the manufacturer material warranty is measured. Manufacturer shall identify and submit allowable routine maintenance requirements to sustain a working system as a warranty condition.
  - c. Manufacturer-approved locations shall be clearly identified by a permanent weather/water-proof and UV-resistant tag, noting the manufacturer representative's name and date of inspection.
  - d. Locations shall be identified by the Owner's Representative and coordinated with the Contractor.
  - e. Manufacturer may note deficiencies in surface preparation, installation, and other means and methods. Work deficiencies shall be reported to the Contractor and Design Professional.
5. After manufacturer observation and training, the compliance of the installation with manufacturer specifications and benchmarks are subject to the opinion of the Design Professional.
- B. Diver Services**
- 1. Diving will be required. Diving services required to complete the installation per contract documents shall be provided by the Contractor at no additional cost to the Owner.
  - 2. Divers shall produce a Diving Services Deployment Plan a minimum of 2 business days in advance of diving.
  - 3. Surface dive crew shall maintain 2-way voice communication capabilities with divers at all times.
  - 4. Where diving services are utilized to install Pile Wrap and Jacketing System, diving services shall provide an underwater camera with lighting apparatus, MP4 format video recorder or approved equivalent, and a color monitor suitable for on-site, real-time viewing.
    - a. Inspections shall be conducted in real-time and recorded. Submit the video recordings of all dive inspections clearly marked with location, date, and time.
- C. Inspection Milestones**
- 1. The Owner shall be given the opportunity to inspect each Pile Wrap and Jacketing System at the following milestones. Owner's inspectors shall be given 48 hours of advanced notice at a minimum:

- a. Pre-Work Condition
  - b. Surface Preparation and Completion of Surface Preparation
  - c. Application and Completion of Tape Application
  - d. Application and Tensioning of Pile Wrap
- D. Deficiency Corrective Measures
- 1. If a task, process, product, or other part of the project installation does not meet the standards described in or referenced by these specifications, the Owner's inspector may choose to issue a notification of deficiency.
  - 2. Upon notification of a deficiency in installation by the manufacturer or required by Owner inspector, the Contractor shall submit a corrective action plan to the Design Professional for approval within 48 hours.
    - a. The corrective action plan should be generated from the manufacturer, and supplemented with Contractor's precautionary measures to ensure that the deficiency will not repeat.
  - 3. Until the corrective action plan is approved, no work shall proceed involving the deficient task, process, product, or other part of the installation process. Delays caused by deficient tasks shall be corrected at no cost to the Owner.
  - 4. Work completed but deemed deficient by the manufacturer shall be removed and replaced with compliant work.
- E. Disputes
- 1. Where compliance with manufacturer specification and benchmark is disputed and deemed unresolvable, the Owner and the Contractor shall provide a position memo describing their respective perspectives.
  - 2. The judgment of the manufacturer representative shall be documented by memo and photographs, distributed to the Owner and the Contractor, and serve as a resolution.
  - 3. The Contractor shall arrange up to (2) evaluations/resolutions by the manufacturer representative at no cost to the Owner, independent of the manufacturer resolution.
- F. Performance Evaluation
- 1. Contractor shall implement an inspection program, confirming that manufacturer performance evaluation criteria have been satisfied at each location.

**END OF SECTION**

**SECTION 06 74 13  
FIBERGLASS REINFORCED GRATINGS**

**PART 1 – GENERAL**

**1.01 SCOPE OF WORK**

- A. The Contractor shall furnish, fabricate (where necessary), and install all fiberglass reinforced plastic (FRP) items, with all appurtenances, accessories and incidentals necessary to produce a complete, operable and serviceable installation as shown on the Contract Drawings and as specified herein, and in accordance with the requirements of the Contract Documents.

**1.02 REFERENCES**

- A. The publications listed below (latest revision applicable) form a part of this specification to the extent referenced herein. The publications are referred to within the text by the designation only.
  - 1. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) Test Methods:
    - a. ASTM D 635 Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position
    - b. ASTM E 84 Surface Burning Characteristics of Building Materials

**1.03 CONTRACTOR SUBMITTALS**

- A. The Contractor shall furnish shop drawings of all fabricated gratings and accessories in accordance with the provisions of this Section.
- B. The Contractor shall furnish manufacturer's shop drawings clearly showing material sizes, types, styles, part or catalog numbers, complete details for the fabrication and erection of components including, but not limited to, location, lengths, type and sizes of fasteners, clip angles, member sizes, and connection details.
- C. The Contractor shall submit the manufacturer's published literature including structural design data, structural properties data, grating load/deflection tables, corrosion resistance tables, certificates of compliance, test reports as applicable, concrete anchor systems and their allowable load tables.
- D. The Contractor may be requested to submit sample pieces of each item specified herein for acceptance by the Design Professional as to quality and color. Sample pieces shall be manufactured by the method to be used in the Work.

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**1.04 QUALITY ASSURANCE**

- A. All items to be provided under this Section shall be furnished only by manufacturers having a minimum of ten (10) years' experience in the design and manufacture of similar products and systems. Additionally, if requested, a record of at least five (5) previous, separate, similar successful installations in the last five (5) years shall be provided.
- B. Manufacturer shall offer a 3 year limited warranty on all FRP products against defects in materials and workmanship.
- C. Manufacturer shall be certified to the ISO 9001-2008 standard.
- D. Manufacturer shall provide proof of certification from at least two other quality assurance programs for its facilities or products (DNV, ABS, USCG, AARR).
- E. Manufacturer shall provide proof, via independent testing, that materials proposed as a solution do not contain heavy metals in amounts greater than that allowed by current EPA requirements.

**1.05 PRODUCT DELIVERY AND STORAGE**

- A. Delivery of Materials: Manufactured materials shall be delivered in original, unbroken pallets, packages, containers, or bundles bearing the label of the manufacturer. Adhesives, resins and their catalysts and hardeners shall be crated or boxed separately and noted as such to facilitate their movement to a dry indoor storage facility.
- B. Storage of Products: All materials shall be carefully handled to prevent them from abrasion, cracking, chipping, twisting, other deformations, and other types of damage. Adhesives, resins and their catalysts are to be stored in dry indoor storage facilities between 70 and 85 degrees Fahrenheit (21 to 29 degrees Celsius) until they are required.

**PART 2 – PRODUCTS**

**2.01 MANUFACTURERS**

- A. FRP Grating molded gratings shall be "Ecograte® 62" as manufactured by

Fibergrate Composite Structures Inc.  
5151 Belt Line Road, Suite 1212  
Dallas, Texas 75254-7028 USA  
(800) 527-4043 Phone (972) 250-1530 Fax  
Website: [www.fibergrate.com](http://www.fibergrate.com)  
E-mail: [info@fibergrate.com](mailto:info@fibergrate.com)

- B. Or approved equal.



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**2.02 GENERAL**

- A. All FRP items furnished under this Section shall be composed of fiberglass reinforcement and resin in qualities, quantities, properties, arrangements and dimensions as necessary to meet the design requirements and dimensions as specified in the Contract Documents.
- B. Fiberglass reinforcement shall be continuous roving in sufficient quantities as needed by the application and/or physical properties required.
- C. Resin shall be Isophthalic Polyester, with chemical formulations as necessary to provide the corrosion resistance, strength and other physical properties as required.
- D. All finished surfaces of FRP items and fabrications shall be smooth, resin-rich, free of voids and without dry spots, cracks, crazes or unreinforced areas. All glass fibers shall be well covered with resin to protect against their exposure due to wear or weathering.
- E. All fire-retardant molded grating products shall have a tested flame spread rating of 25 or less per ASTM E-84 Tunnel Test. Gratings shall not burn past the 25 mm reference mark and will be classified HB per ASTM D635.
- F. All mechanical grating clips shall be manufactured of Type 316SS (stainless steel).
- G. All exposed grating edges shall be banded.

**2.03 MOLDED RFP GRATING**

- A. Must have a minimum 60% open area for light transmittance. Open area calculation must include both load and cross bars.
- B. Must be ADA compliant with a maximum open space between load bars of 1/2 inch.
- C. Depth: 1 inch with a tolerance of +/- 1/16 inch.
- D. Mesh Configuration: 3/4 inch x 4 inch with a tolerance of +/- 1/16 inch mesh centerline to centerline.
- E. Load/Deflection: Grating shall meet manufacturer's published safe recommended loadings with deflection not to exceed the following:
  - 1. Maximum deflection of 0.10 inches with a uniform distributed load of 100 pounds per square foot at 24 inch clear span.
- F. Manufacture: Grating shall be of a one-piece molded construction with tops and bottoms of bearing bars and cross bars in the same plane. Grating shall have rectangular mesh pattern providing unidirectional strength. Grating shall be reinforced with continuous roving of equal number of layers in each direction. The top layer of reinforcement shall be no more than 1/8 inch below the top surface of the grating so as to provide maximum stiffness and prevent resin chipping of unreinforced surfaces. Percentage of glass (by weight) shall not exceed 35% so as to achieve maximum corrosion resistance.

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After molding, no dry glass fibers shall be visible on any surface of bearing bars or cross bars. All bars shall be smooth and uniform with no evidence of fiber orientation irregularities, interlaminar voids, porosity, resin rich or resin starved areas.

- G. Resin system: The resin system used in the manufacture of the grating shall be Corvex® or approved equivalent.
- H. Grating bar intersections are to be filleted to a minimum radius of 1/16 inch to eliminate local stress concentrations and the possibility of resin cracking at these locations.
- I. Fire rating: Grating shall be fire retardant with a tested flame spread rating of 25 or less when tested in accordance with ASTM E 84.
- J. Corrosions resistance: Manufacturer may be required to submit corrosion data from tests performed on actual grating products in standard chemical environments. Corrosion resistance data of the base resin from the manufacturer is not a true indicator of grating product corrosion resistance and shall not be accepted.
- K. Non-slip surface: Gating shall be manufactured with a barefoot friendly aqua-grit (sugar grit) to the top surface of each bar providing maximum slip resistance, except at the gangways where the grating shall be manufactured with an integrally applied grit to the top surface of each bar providing maximum slip resistance.
- L. Resin used to apply texture shall be cured using infrared (IR) heat for maximum durability.
- M. Color: Select from Manufacturers standard colors offered for this product: Light Gray
- N. The manufacturer shall certify that the stiffness of all panels manufactured is never more than 2.5% below the published load-deflection values.
- O. Substitutions: Other products of equal configuration, strength, stiffness, corrosion resistance and overall quality may be submitted with the proper supporting data to the Design Professional for approval ten (10) days prior to bid date. Only preapproved substitutions will be considered as meeting the requirements of the specification.

## **2.04 GRATING FABRICATION**

- A. Measurements: Grating supplied shall meet the dimensional requirements and tolerances as shown or specified. The Contractor shall provide and/or verify measurements in field for work fabricated to fit field conditions as required by grating manufacturer to complete the work. When field dimensions are not required, Contractor shall determine correct size and locations of required holes or cutouts from field dimensions before grating fabrication.
- B. Layout: Each grating section shall be readily removable, except where indicated on drawings. Manufacturer to provide openings and holes where located on the contract drawings. Grating openings which fit around protrusions (pipes, cables, machinery, etc.) shall be discontinuous at approximately the centerline of opening so each section of grating is readily removable.

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- C. Sealing: All shop fabricated grating cuts shall be sealed to provide maximum corrosion resistance. All field fabricated grating cuts shall be coated similarly by the contractor in accordance with the manufacturer's instructions and approved sealers.
  - D. Hardware: Type 316 stainless steel hold-down clips shall be provided and spaced at maximum of 4 feet apart with a minimum of 4 per piece of grating, or as recommended by the manufacturer.

### **PART 3 – EXECUTION**

#### **3.01 INSPECTION**

- A. Shop inspection is authorized as required by the Owner and shall be at Owner's expense. The fabricator shall give ample notice to Contractor prior to the beginning of any fabrication work so that inspection may be provided. The grating shall be as free, as commercially possible, from visual defects such as foreign inclusions, delamination, blisters, resin burns, air bubbles and pits. The surface shall have a smooth finish (except for grit top surfaces).

#### **3.02 INSTALLATION**

- A. Contractor shall install gratings in accordance with manufacturer's assembly drawings. Fasten grating panels securely in place with hold-down fasteners as specified herein. Field cut and drill fiberglass reinforced plastic products with carbide or diamond tipped bits and blades. Seal cut or drilled surfaces in accordance with manufacturer's instructions. Follow manufacturer's instructions when cutting or drilling fiberglass products or using resin products; provide adequate ventilation.

**END OF SECTION**

# **DIVISION 09**

## **FINISHES**

**SECTION 09 97 13  
METAL COATINGS**

**PART 1 – GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Refer to WSDOT Standard Specification 6-03.3(30) and 6-07 except as supplemented herein.

**1.02 SUMMARY**

- A. This work shall consist of painting systems and colors for metal elements as shown on the Plans and not specified elsewhere in the contract documents.

**PART 2 – PRODUCTS**

**2.01 MATERIALS**

- A. WSDOT Standard Specification Section 6-07.2 is supplemented with the following:
  - 1. Paint materials shall comply with the requirements in WSDOT Standard Specification Section 9-08 unless described otherwise in this section.
- B. Galvanizing
  - a. All fabricated steel components and materials to be galvanized per ASTM 123.
  - b. All steel hardware components and materials to be galvanized per ASTM 153.
- C. Metallic Paint System
  - 1. Metallic paint system shall be of aliphatic acrylic polyurethane or acrylic polyurethane finish coat that contains a sparkle aluminum pigment creating a metallic aesthetic finish. It shall be a highly durable coating, resistant to abrasion, wet conditions and exterior weathering. Finish shall contain UV absorbers for extended color and gloss retention. Finish shall be semi-gloss finish.
- D. Steel Poles and Steel Sub-Assemblies Paint Specifications:
  - 1. Steel poles and sub-assemblies shall be factory galvanized, primed and finished with polyester powder coating per Section 6-07 and Section 9-08 of the WSDOT Standard Specifications.
- E. Aluminum Poles, Aluminum Sub-Assemblies and Aluminum Luminaire Housings Specifications:

**LUTHER BURBANK PARK WATERFRONT IMPROVEMENTS  
SECTION 09 97 13  
METAL COATINGS**

1. Luminaires and other aluminum components shall be factory primed and painted with polyester powder coating to recommended industry standards and shall meet AAMA 2604 performance requirements and test procedures.

**F. Powder Coating Paint System**

1. The powder coating paint system shall be composed of exterior grade pure polyester TGIC, dry powder including resins, and pigments in accordance with requirements of AAMA 605.2., and shall have the following characteristics:

	<b>Glossy Surface</b>	<b>Semi-Gloss Surface</b>	<b>Mat Surface</b>
Thickness	2.5-3.5 mils/60-90	2.5-3.5 mils/60-90	2.5-3.5 mils/60-90
Gloss (1)	80-90	55-70	15-25
Cross Hatch Adhesion (2)	Pass 100%	Pass 100%	Pass 100%
Mandrel Bending (3)	1/8"/3 mm	5/32"/4 mm	3/16"/5 mm
Erichsen Cupping ISO 1520	5/16"/8 mm	1/4"/7 mm	3/16"/5 mm
Impression Hardness (4)	95	95	95
Impact Test (5)	Up to 160"/lb	Up to 160"/lb	Up to 160"/lb
Pencil Hardness (6)	2H (min.)	2H (min.)	2H (min.)
Dry Mill Test	OK	OK	OK
Salt Spray Test (7)	1500 h test, max. undercut 1/16"/1 mm	1500 h test, max. undercut 1/16"/1 mm	1500 h test, max. undercut 1/16"/1 mm
Humidity Resistance (8)	1500 h test, min. blisters 1/16"/1 mm	1500 h test, min. blisters 1/16"/1 mm	1500 h test, min. blisters 1/16"/1 mm

**Key:**

- (1) Gloss According to Gardner 60 degrees, ASTM D 523.
- (2) Cross Hatch Adhesion, ASTM D 3359, Method B.
- (3) Mandrel Bending Test, ASTM D 522.
- (4) Impression hardness, ASTM B 3363.
- (5) Impact Test, ASTM D 2794; (0.1) inch distortion.
- (6) Pencil Hardness, ASTM B 3363.
- (7) Salt spray Resistance Test, ASTM B 117.
- (8) Humidity Resistance Test, ASTM D 2247.

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**2.02 SUBMITTALS**

1. The Contractor shall provide a swatch paint sample from the pole manufacturer for use as a color match for the Owner's approval prior to factory finish coating. Contractor shall also provide two gallons of touch-up paint to the Owner.
2. Painting plan submittals shall be per WSDOT Standard Specifications Section 6-07 Painting.
3. The Contractor shall submit (3) samples of each custom color, textures, and gloss for approval. Metal coupon samples shall be three (3) inches by five (5) inches. Paint colors and paint systems shall be as shown in the following table for the following items:

**Paint Color / Paint System Table**

<b>Spec</b>	<b>Item</b>	<b>Paint Color</b>	<b>Paint System</b>
8-21	Permanent Signing: Back of Sign Panels and Posts	Black	Powder Coating Paint System
8-27	Drinking Fountain and Pet Station	Black	Paint System shall be per Manufacturer
9-29	Luminaire Pole	"Bronze" to match Luminaire color	Powder Coating Paint System
9-29.10(2)	Luminaire and Mount	"Bronze"	Paint System shall be per Manufacturer

**2.03 QUALITY ASSURANCE**

- A. Materials specified are those that have been evaluated for the specific service. The paint and paint products used for this project shall be approved by Owner and Design Professional.
- B. Requirements for an Approved Equal:
  1. Contractor shall provide to the Owner in writing a detailed side-by-side comparison of the proposed equal Products Characteristics, Performance Characteristics, and Application Conditions for each coating specified in this specification.
  2. For consideration for approval this written comparison shall be certified and notarized by an officer of the proposed manufacturer as true and correct.

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3. For Products Characteristics this detailed side-by-side comparison shall include for example, but not limited to, Volume Solids, Weight Solids, VOC, Mix Ratio, Zinc Content in Dry Film (by Weight), Spreading Rate per coat, Drying Schedule, Shelf Life and Flash Point.
  4. For Performance Characteristics this detailed side-by-side comparison shall include for example, but not limited to, Abrasion Resistance, Tensile Strength, Humidity, Graffiti Resistance, Adhesion, Salt Fog Resistance and Slip Coefficient.
  5. The Contractor shall submit (3) samples of each custom color, textures, and gloss for approval. Appropriate metal coupon samples (steel and aluminum) shall be three (3) inches by five (5) inches. Paint colors and paint systems shall be as shown in the Paint Color/Paint System Table for the various items as included in this Section.

### **PART 3 – CONSTRUCTION REQUIREMENTS**

#### **3.01 SUPPLEMENT WSDOT STANDARD SPECIFICATION 6-07.3 WITH THE FOLLOWING:**

- A. Paint shall be provided as follows:
  1. Steel
    - a. Surface Preparation: Shop sandblast using SSPC-SP6 Commercial Blast, using non-metallic abrasive.
    - b. Prime Coat: Advance two-component, moisture-cured, zinc-rich primer providing extraordinary performance. Is rapid curing so chemical- and corrosion-resistant topcoats can be applied the “same-day.” Also can be used for field touch-up of inorganic zinc coating. Applied at 2.5 - 3.5 mils DFT (falls under the CARB Metallic pigmented category)
    - c. Intermediate Coat: Polyamide Epoxy at 4.0 - 6.0 mils DFT (less than 100 grams/Liter VOC), meet performance requirements of AWWA C 210. Low VOC, excellent resistance to abrasion and suitable for chemical contact exposure.
    - d. Finish Coat: Advanced Thermoset Solution Fluoropolymer, high-solids fluoropolymer coating that provides an ultra-durable finish with user friendly brush. Outstanding color and gloss retention even in most severe exposures. Semi-gloss finish.
  2. Galvanized & Aluminum Metals
    - a. Surface Preparation: Abrade 100% of area using a metal finishing pad designed for removing light rust and for cleaning and brightening metal to degloss and create profile.
    - b. Prime Coat: Polyamide epoxy shall be a versatile low-temperature coating ideally suited for steel fabrication and OEM applications, widely used as a field tiecoat, provides fast curing, rapid handling capabilities and conforms with air



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- pollution regulations limiting Volatile Organic Compounds (VOC) to a maximum of 340 grams/liter (2.8 lbs/gal). Applied at 3.0 mils DFT.
- c. Finish Coat: An Acrylic Polyurethane finish coat that contains sparkle aluminum pigment creating a metallic finish. Highly durable coating, resistant to abrasion, wet conditions and exterior weathering. High performance finish shall contain UV absorbers for extended color and gloss retention. Semi-gloss finish. Applied at 2.0 mils DFT.
  - B. Apply entire finish system in the shop. Hold back finish system at all areas to be field welded. Bolted connections should be primed with a zinc based primer compatible with the approved paint system.
  - C. Field touch up painting shall consist of matching specified priming and painting for all damaged and field repaired areas. Field welds and abrasions should be touched up after installation. Touch up surface preparation with a zinc based primer compatible with the approved paint system, 2.5 to 3.5 mils DFT.
  - D. Preparation, cleaning, priming, shop painting and field touch-up for all fabricated decorative exterior metal work will be incidental to the associated bid items.
  - E. Immediately remove coatings that fall on surrounding areas and surfaces not scheduled to be coated.
  - F. WSDOT Standard Specification 6-07.3(14) is supplemented as follows:
    - 1. Painting of Aluminum Surfaces
      - a. All aluminum items specified herein to be powder coated shall be factory primed and powder coated in accordance with the manufacturer's recommendations and 2021 WSDOT Standard Specifications.
      - b. The paint color of aluminum surfaces shall be per WSDOT Standard Specification 6-07.2.

**END OF SECTION**

**DIVISION 10**

**SPECIALTIES**

**SECTION 10 14 00**  
**PARK SIGNAGE**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. Furnish all labor, equipment, and materials necessary for the provision and installation of miscellaneous site improvement items, including, but not limited to, the following:
  - 1. Medallions
  - 2. Kiosk
  - 3. Interpretive Sign Bracket
  - 4. Trail Universal Access Signs
  - 5. Other Informational Signs—input on signs to include forthcoming from the City

**1.02 OWNER-FURNISHED ITEMS**

- A. The Owner shall furnish the Medallions, Kiosk, and Informational Signs for installation by the Contractor.

**1.03 RELATED SECTIONS**

- A. Section 05 50 00 “Metal Fabrications”
- B. Section 09 97 13 “Steel Coatings”

**1.04 REFERENCE STANDARDS**

- A. ANSI/ICC A117.1 (American National Standards Institute/International Code Council), 2009. *American National Standard for Accessible and Usable Buildings and Facilities*. International Code Council.
- B. Architectural and Transportation Barriers Compliance Board, 2010. *Americans with Disabilities Act Accessibility Guidelines (ADAAG)*.
- C. WSDOT (Washington State Department of Transportation), 2025. Standard Specifications for Road, Bridge, and Municipal Construction; and Amendments (current edition).
- D. WSDOT, 2021. *Sign Fabrication Manual* (current edition).
- E. U.S. Department of Transportation, 2023. Manual on Uniform Traffic Control Devices (MUTCD).

**1.05 SUBMITTALS**

- A. Product Data: For each type of product that is Contractor provided.

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- B. Shop Drawings: For the Kiosk, Interpretive Sign Bracket, and Trail Universal Access Signs
    - 1. Include fabrication and installation details and attachments to other work.
    - 2. Show sign-mounting heights, locations of supplementary supports to be provided by other installers, and accessories.
    - 3. Show the message list; typestyles; and graphic elements, including raised characters and Braille; and at least a half-size layout for each sign.
  - C. Selection Samples: Where colors are not specified, submit two sets of color-selection charts or chips.
  - D. Manufacturer's Installation Instructions: Include installation templates and attachment devices.
  - E. Informational Submittals: Sample warranty
  - F. Closeout Submittals: Maintenance data
  - G. Warranty
    - 1. Special Warranty: The manufacturer agrees to repair or replace components of signs that fail in materials or quality of work within a specified warranty period.
    - 2. Warranty Period: 5 years from the date of Substantial Completion

#### **1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: A company specializing in manufacturing the products specified in this section with a minimum 5 years of documented experience

### **PART 2 – PRODUCTS**

#### **2.01 PERFORMANCE REQUIREMENTS**

- A. Accessibility Compliance: All signs shall comply with ADAAG, ANSI/ICC A 117.1, and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.
- B. Include all types of signage as required by applicable codes.

#### **2.02 MEDALLIONS**

- A. Owner provided

#### **2.03 KIOSK**

- A. Owner provided

**2.04 INTERPRETIVE SIGN BRACKET**

- A. Interpretive Sign Mounting: As shown on the Drawings
- B. Sign Support: As shown on the Drawings; refer to Section 05 50 00 – Metal Fabrications for material, fabrication and finish
- C. Hardware and fasteners shall conform to Section 05 50 00 – Metal Fabrications.

**2.05 TRAIL UNIVERSAL ACCESS SIGNS**

- A. Owner provided.

**2.06 INFORMATIONAL SIGNS**

- A. Owner provided.

**PART 3 – EXECUTION**

**3.01 EXAMINATION**

- A. Verify that substrate surfaces are ready to receive work.

**3.02 DELIVERY, STORAGE, AND HANDLING**

- A. Package signs as required to prevent damage before installation.

**3.03 INSTALLATION – MEDALLIONS**

- A. Install in accordance with the manufacturer's instructions and per the plans.
- B. Install neatly, with face flush with adjacent concrete paving.
- C. Locate medallions where indicated on the plans. Stake a location for approval prior to installation.
- D. Protect from damage until Substantial Completion; repair or replace damaged items.

**3.04 INSTALLATION – KIOSK**

- A. Install in accordance with the manufacturer's instructions.
- B. Locate where indicated on the plans. Stake a location for approval prior to installation. Install plumb and true in locations indicated on the Drawings and as directed.
- C. Secure signs with hardware as approved.
- D. Protect from damage until Substantial Completion; repair or replace damaged items.

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**3.05 INSTALLATION – INTERPRETIVE SIGN BRACKET**

- A. Install per the plans.
- B. Locate where indicated on the plans. Stake a location for approval prior to installation.  
Install plumb and true in locations indicated on the Drawings and as directed.
- C. Secure signs with hardware as approved.
- D. Protect from damage until Substantial Completion; repair or replace damaged items.

**3.06 INSTALLATION – TRAIL UNIVERSAL ACCESS SIGNS AND INFORMATIONAL SIGNS**

- A. General: Install signs using mounting methods indicated and according to the manufacturer's written instructions and the plans.
- B. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
- C. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.
- D. Install sign units and components at the locations shown or scheduled, securely mounted. Verify clearance, anchorage method, and final location for each sign before installation. Some reasonable adjustment of location shall be assumed as part of the basic work, at no additional cost.
- E. Signs shall be mounted using concealed screws, anchor bolts, or adhesive fasteners, as detailed or noted previously.
- F. Mounting Methods
  - 1. Concealed Studs: Using a template, drill holes in the substrate, aligning with studs on the back of the sign. Remove loose debris from the hole and substrate surface.
    - a. Masonry Substrates: Fill holes with adhesive. Leave recess space in the hole for displaced adhesive. Place the sign in position and push until flush to surface, embedding studs in the holes. Temporarily support the sign in position until the adhesive fully sets.
  - 2. Thin or Hollow Surfaces: Place the sign in position and flush to surface, install washers and nuts on studs projecting through the opposite side of the surface, and tighten.
  - 3. Through Fasteners: Drill holes in the substrate using predrilled holes in the sign as a template. Countersink holes in the sign, if required. Place the sign in position and flush to surface. Install through fasteners and tighten.
  - 4. Adhesive: Clean bond-breaking materials from the substrate surface, and remove loose debris. Apply linear beads or spots of adhesive symmetrically to the back of the sign and of suitable quantity to support the weight of the sign after curing without slippage. Keep adhesives away from edges to prevent adhesive extrusion as the sign is applied and to prevent visibility of cured adhesive at sign edges. Place the sign in

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position, and push to engage adhesive. Temporarily support the sign in position until the adhesive fully sets.

5. Two-Face Tape: Clean bond-breaking materials from the substrate surface, and remove loose debris. Apply tape strips symmetrically to the back of the sign and of suitable quantity to support the weight of the sign without slippage. Keep strips away from edges to prevent visibility at sign edges. Place the sign in position, and push to engage tape adhesive.

### **3.07 PROTECTION OF WORK**

- A. Provide protection of signage elements during construction. Repair finishes of signs and surrounding architectural surfaces damaged by field installation. Restore finishes so there is no evidence of corrective work. Return items that cannot be refinished in the field to the shop, make required alterations, and refinish the entire unit or provide a new unit at the fabricator's option.

**END OF SECTION**

# **DIVISION 12**

# **FURNISHINGS**



**SECTION 12 93 00  
SITE FURNISHINGS**

**PART 1 – GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. Provide all labor, materials, and equipment necessary to supply and install the following:
  - 1. Trash and recycling receptacles – Owner provided, contractor installed
  - 2. Benches – Owner provided, contractor installed
  - 3. Picnic tables – Owner provided, contractor installed
  - 4. Although not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances, and devices incidental to or necessary for complete installation.

**1.02 RELATED SECTIONS**

- A. Section 05 50 00 – Metal Fabrications
- B. Section 32 13 13 – Concrete Paving and Miscellaneous Concrete

**1.03 QUALITY ASSURANCE**

- A. Manufacturer's Instructions: Adhere to the manufacturer's instructions for product handling, assembly and installation, and maintenance.
- B. The manufacturer's original factory finish must be intact for the installation to be considered satisfactory. On-site touch-ups will not be accepted.

**1.04 SUBMITTALS**

- A. For each owner-provided product specified, ensure the owner has also provided the following for reference prior to installation:
  - 1. Manufacturer's product data
  - 2. Manufacturer's warranty
  - 3. Manufacturer's installation instructions
  - 4. Color samples for each product if provided by Contractor.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Coordinate with Owner's Representative to ensure that all owner provided site furnishings are undamaged after installation and are protected during Project construction prior to final acceptance

## **PART 2 – PRODUCTS**

### **2.01 TRASH AND RECYCLING RECEPTACLES**

- A. Owner provided.

### **2.02 BENCHES**

- A. Owner provided.

### **2.03 PICNIC TABLE**

- A. Owner provided.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION**

- A. Verify installation conditions are satisfactory to receive Work described in this section. Do not install until unsatisfactory conditions are corrected. Beginning Work constitutes acceptance of conditions as satisfactory.

### **3.02 SURFACE-MOUNT INSTALLATIONS**

- A. Surface installations shall be made only upon approved concrete surfaces.
- B. Use only manufacturer-approved anchoring devices.
- C. Where the manufacturer does not provide a specification for anchoring, use only approved stainless-steel expansion bolts, as follows:
  - 1. Do not proceed with bolt installation until concrete pavement has had a minimum of 14 days cure time in normal conditions. Where weather conditions are beyond the range of normal, do not proceed with anchor installation without the approval of the Owner.
  - 2. Size to the largest standard diameter that the manufacturer's premade hole will accommodate without force, typically 1/2-inch for a 5/8-inch hole.
  - 3. Size for embedment of 3/4 of the actual depth of concrete to support the installation, in no case less than 3-1/2 inches. Allow for depth of the nut plus three to five threads' protrusion above the finished installation.
  - 4. Do not over-drill more than 1/8-inch beyond the depth necessary to accommodate the anchor.
  - 5. Torque to 80% to 85% of the anchor manufacturer's recommended maximum.

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**3.03 INSTALLATION OF MANUFACTURED ITEMS**

- A. Install all equipment in accordance with the Specifications, Contract Documents, and manufacturer's directions. When these may be in conflict, the more stringent requirements govern.

**3.04 CLEANUP**

- A. Remove all metal, wood, and concrete debris; protective wrappings and coverings; and shipping materials from the Project site. Remove all residues, and repair all stains, scuffs, abrasions, and marks from the finished product prior to requesting inspection. Fully restore all areas of the site that were impacted by the installation activities.

**END OF SECTION**

**DIVISION 26**

**ELECTRICAL AND LIGHTING**

**SECTION 26 05 00**  
**COMMON WORK RESULTS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This section includes general electrical requirements for all Divisions 26 work and is supplemental and in addition to the requirements of Division 01.
- B. Section Includes:
  - 1. Electrical equipment coordination and installation.
  - 2. Common electrical installation requirements.
- C. General Requirements: Conform to Contract Documents. This section is supplemental and in addition to requirements of Division 01.
- D. Conditions and Requirements: Conditions and requirements of the General Provisions, Supplemental General provisions and Special Provisions are hereby made a part of the Electrical Division of this Specification. If requirements disagree, the more stringent requirement will become the contractual obligation.
- E. 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 at no increase in Contract Sum.
- F. Workmanship shall be of the best quality and competent and experienced electricians shall be employed and shall be under the supervision of a competent and experienced foreman.
- G. The drawings and specifications are complimentary and what is called for (or shown) in either is required to be provided as if called for in both.

**1.3 DEFINITIONS**

- A. Definitions of all terms shall be in accordance with applicable definitions of:
  - 1. AIA - American Institute of Architects

- |    |      |   |  |
|----|------|---|--|
| 2. | IEEE | - | Institute of Electrical and Electronic Engineers |
| 3. | IES  | - | Illuminating Engineering Society                 |
| 4. | NEMA | - | National Electrical Manufacturers Association    |
| 5. | NEC  | - | National Electrical Code                         |
| 6. | IBC  | - | International Building Code                      |
| 7. | IFC  | - | International Fire Code                          |
| 8. | ADA  | - | Americans with Disabilities Act                  |
| 9. | NFPA | - | National Fire Protection Association             |

#### **1.4 CODES**

- A. Codes for installation of electrical work shall be State of Washington Electrical Code, Electrical Safety Code, applicable rules and regulations and OSHA and Washington Industrial Safety and Health Act. Any violation of the above Safety Codes shall be cause for immediate termination of Contractor's authority to proceed with work, and recourse to surety for completion of the project.

#### **1.5 PERMITS AND INSPECTIONS**

- A. Obtain permits and pay fees required by governmental agencies having jurisdiction over this work.
- B. Submit electrical plans to City of Mercer Island for electrical plan review. Pay electrical plan review fee. If necessary, obtain conduit only permit to allow electrical work to begin while plan review is underway.
- C. Arrange for inspections required during construction. On completion of work, furnish satisfactory evidence to show all work installed in accordance with codes.

#### **1.6 CLEARANCES**

- A. Adequate working space shall be provided around electrical equipment for maintenance and operation. Minimum clearances shall conform to Art. 110-26 of N.E. Code.

#### **1.7 TESTS**

- A. Test all wiring and connections for continuity and grounds before any fixtures or equipment are connected, and run a Megger test. Where such tests indicate faulty insulation or other defects, all such defects and faults shall be located, repaired and tested again.
- B. Make check of proper load balance on 3-wire system and on phases of 3-phase system. Check direction of rotation and lubrication on all motors after final service connections have been made.

**1.8 INDUSTRY STANDARDS, CODES AND SPECIFICATIONS**

- A. All materials, equipment, and systems shall conform to the following applicable Industry Standards, Codes and Specifications:

1. ANSI - American National Standards Institute
2. IEEE - Institute of Electrical and Electronic Engineers
3. IES - Illuminating Engineering Society
4. IPCEA - Insulated Power Cable Engineers Association
5. NFPA - National Fire Protection Association
6. NEMA - National Electrical Manufacturers Association
7. UL - Underwriters Laboratory
8. IBC - International Building Code
9. IFC - International Fire Code
10. IMC - International Mechanical Code
11. ADA - Americans with Disabilities Act (Washington State ADA/WAC51-30)
12. WAC - Washington Administrative Code
13. NEC - National Electrical Code

- B. Where differences occur between state laws, local ordinances, industry standards, utility company regulations and the Contract Documents, the most stringent shall govern.

**1.9 QUALITY ASSURANCE**

- A. Regulatory Requirements:

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

**1.10 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. Provide protective coverings during construction.
- B. Identify materials and equipment delivered to the Site to permit check against approved materials list, and reviewed submittals.

**1.11 PROJECT CONDITIONS**

- A. Equipment Rough-In:

1. Rough-in locations for equipment furnished under other Divisions and for equipment furnished by Owner are approximate only. Obtain exact rough-in locations from the following sources:
  - a. From Shop Drawings for Contractor provided equipment.
  - b. From Architect for Owner furnished, Contractor installed equipment.

**1.12 MATERIAL AND EQUIPMENT ENVIRONMENT**

- A. All equipment and material shall be suitable for the environment of the installation, and the installation including equipment shall satisfy the governmental agencies having jurisdiction

**1.13 DRAWINGS AND SPECIFICATIONS**

- A. Specifications, with drawings, are intended to cover installation of all electrical equipment. Materials shown and called for on drawings, but not mentioned in specifications, or vice versa, necessary for proper completion and operation of equipment, shall be furnished the same as if called for in both.
- B. Electrical drawings do not attempt to show complete details of project construction which affect electrical installations. Refer to architectural, structural and mechanical drawings for additional details which affect installation of this work.

**1.14 COORDINATION**

- A. Coordinate arrangement, mounting, and support of electrical equipment:
  1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
  2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
  3. To allow right of way for piping and conduit installed at required slope.
  4. So connecting raceways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.
- B. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.
- C. Coordinate location of access panels and doors for electrical items that are behind finished surfaces or otherwise concealed. Access doors and panels are specified in Division 08 Section "Access Doors and Frames."
- D. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 07 Section "Penetration Firestopping."



- E. Before installation Contractor shall make proper provisions for electrical work and to avoid interferences with installation of other work. Any changes caused by neglect to do so shall be made at Contractor's expense.
- F. Electrical drawings and specifications shall be compared with drawings and specifications of other trades and any discrepancies between them reported to the Architect prior to installation of work.
- G. Coordinate and arrange work so there is no interference between wiring outlets, lighting fixtures, and raceways with sheet metal work, insert hangers, mechanical piping, and structural members.

**1.15 CUTTING AND PATCHING**

- A. Do all cutting and patching for installation of the work. All cutting done carefully to prevent damage to work of other trades, and all patching done by mechanics skilled in the trade affected, and subject to approval by Architect. Provide all work per Division 01. Work shall include:
  - 1. All openings for removed equipment shall be patched or entire system replaced. No openings shall remain at completion of work.
  - 2. Exterior cutting and patching shall be done by qualified Contractors. Patching of asphalt and concrete shall be per Division 01 and approved by Civil Engineers and Architect. Grass and earth patching, seeding, and sod work shall be per Division 01 and approved by the Landscaper, Civil Engineer, and Architect. All backfill per Division 01.
  - 3. Painting: All exposed conduit, boxes, surface metal raceway, enclosures, multi-outlet assemblies shall be painted to match wall color. Where exact color unknown, coordinate with Architect to obtain color. All items shall be painted regardless of whether wall, ceiling, floor finish is painted.

**1.16 RUBBISH AND CLEAN-UP**

- A. Contractor shall promptly remove waste material and rubbish caused by workers.
- B. At completion of work, clean all fixtures, electrical panel interiors, switchboards, distribution centers, and all other equipment installed.

**1.17 SCOPE OF WORK**

- A. Mention herein or indication on drawings of articles, materials, operations or methods, requires that Contractor provide each item mentioned or indicated, of quality, or subject to qualifications noted; perform according to conditions stated, each operation prescribed.
- B. Work included under this contract provides for all labor, equipment, and materials to complete all electrical work as outlined in drawings and specifications for project.

C. The scope of this work is listed generally but is not limited to as follows:

1. Lighting System and fixtures
2. Panelboards
3. Branch wiring, power, lighting, and equipment
4. Equipment connections
5. New power service

#### **1.18 SUBMITTALS**

A. General:

1. Submittals shall be in accordance with requirements of Division 01 and as specified.
2. Forward all submittals to the Architect, together, at one time. Individual or incomplete submittals are not acceptable.
3. Organize submittals in same sequence as they appear in Specification Sections.
4. Identify each submittal item by reference to Specification Section paragraph in which item is specified, or Drawing and Detail number.
5. 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.

B. Shop Drawings:

1. Show physical arrangement, construction details, finishes, materials used in fabrication, provisions for conduit entrance, access requirements for installation and maintenance, physical size, electrical characteristics, foundation and support details, and weights.
2. Catalog cuts and published material may be included to supplement Shop Drawings.

C. Contract Closeout Submittals:

1. Operation and Maintenance:
  - a. Subsequent to final completion, and testing operations, instruct Owner's authorized representatives in operation, adjustment, and maintenance of electrical plant.
  - b. Before Owner's personnel assume operation of systems, submit operating and maintenance instructions, manuals, parts lists on electrical plant, its component parts, including all equipment which requires, or for which the manufacturer recommends, maintenance in a specified manner. Data sheets shall show complete internal electrical wiring, ratings, and characteristics, catalog data on components parts whether furnished by equipment manufacturer or others, names, addresses, and telephone numbers of source of supply for parts subject to wear or electrical failure, and description of operating, test, adjustment, and maintenance procedures.

- D. Submit the equipment list to the Architect for final review. This list shall consist of, but not be limited to, the basic items applicable to the project as follows:
  - 1. Lighting System and fixtures
  - 2. Branch wiring, power, lighting, and equipment
  - 3. Conduit and Fittings

**1.19 ELECTRICAL EQUIPMENT MAINTENANCE MANUALS**

- A. The Electrical Contractor shall prepare maintenance manuals for the servicing of all equipment installed as a part of the construction contract.
- B. The information contained in the manuals shall be grouped in an orderly arrangement under basic categories, i.e., Secondary Systems Equipment, Special Raceways, Motors & Controls, Lighting Equipment, etc.

**1.20 JOB RECORD INFORMATION**

- A. Record drawings shall be continuously maintained in the field by the Contractor. Drawings used for this purpose shall be the latest revision and shall be kept neat and clean.
- B. Drawings shall include dimensions on all underground conduit.

**1.21 NAMEPLATES AND TAGS IN ADDITION TO 260553**

- A. The following items shall be equipped with tags or nameplates with etched letters:
  - 1. All motors, transformers, motor starters, pushbutton stations, control panels and time switches.
  - 2. Disconnect switches, fused or unfused; switchboards and panelboards; circuit breakers, contactors or relays in separate enclosures.
  - 3. Wall switches controlling outlets, or equipment where the outlets are not located within sight of the controlling switch. All low voltage lighting switches.
  - 4. Special electrical systems shall be properly identified at junction and pull boxes, terminal cabinets and equipment racks.
  - 5. Label all junction boxes with pen indicating type of system (i.e. Power, Data, etc.), circuit voltage, panel and circuit number and switch leg.
  - 6. Tags shall adequately describe the function of, or use of, the particular equipment involved. Tags for panelboards and switchboards shall include the panel designation, voltage and phase of the supply. For example, "Panel A, 208V/120V." The name of the machine shall be the same as the one used on all motor starter, disconnect and P.B. station tags for that machine.
  - 7. Tags for 120/208 volts shall be laminated phenolic plastic with white engraved letters on black background. Tags for emergency systems identification shall be red with white lettering. Lettering shall be 3/16" high at pushbutton stations, thermal overload

switches, receptacles, wall switches and similar devices, where the tag is attached to the device plate. All other locations, lettering shall be 1/4" high, unless otherwise detailed on the drawings. Tags shall be securely fastened to the equipment with screws or brass bolts. Contact cement is approved in dry locations. All tags and their installation are a part of this work.

#### **1.22 FINAL SUBMITTALS**

- A. After completion of all electrical work and prior to final inspection, submit the following:
1. Letter addressed to Engineer, stating that Contractor, or superintendent in charge of job, has personally made a complete inspection of the job; that those items found to be defective in material or workmanship or not in conformance with drawings and specifications have been corrected; and that entire electrical job is ready for final observation by Engineer.
  2. One copy of the electrical equipment maintenance manual to be sent direct to Engineer for review, containing the following:
    - a. Letter of transmittal, addressed to Engineer, containing a list of suppliers of replacement parts for all electrical equipment used on job.
    - b. Panel, switchboard, and control drawings corrected to agree with Engineer's notations.
    - c. Catalog cuts of all lighting fixtures, lamps, transformers, starters, special devices, door control system, and all other equipment used on job.
    - d. All available maintenance data published.
    - e. Wiring diagrams and operating instructions for all systems installed.
    - f. Marked-up set of prints showing exact location of all conduits and outlets deviating from original plans. Purchase prints new for this purpose. Prints not required to be bound in maintenance manual.
    - g. Signed receipts for all loose items i.e. keys, instructions and guarantee, etc.
  3. Refer to Division 01 for Operations and Maintenance Manuals.

#### **1.23 WARRANTY**

- A. Warranties shall be provided per Division 01. Where not indicated provide minimum 1 year (or standard manufacturer's warranty if longer) warranty for all equipment installed on this project. Warranty shall include all labor, site visit, installation costs.

#### **1.24 PAY REQUEST SUBMITTALS**

- A. In addition to the requirements of other Divisions of the Specifications, provide substantiating data for Architect's review.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Materials and Equipment General Requirements:
  - 1. All items of materials in each category of equipment shall be of one manufacturer.
  - 2. Groups of items having same or similar function shall be by single manufacturer to facilitate maintenance and service.
  - 3. Compatible with space allocated. Modifications necessary to adjust items to space limitations shall be at Contractor's expense.
  - 4. Conform with conditions shown and specified. Coordinate with other trades for best possible assembly of completed Work.
  - 5. Install fully operating without objectionable noise or vibration.
- B. Access Doors:
  - 1. Furnish under this Division where shown, required by regulatory agencies, and for access to all concealed electrical items requiring access. Access doors shall be in accordance with requirements of Division 08. Doors in this Division, Division 08, and Division 15 shall be from the same manufacturer for identical appearance and keying. Furnish fire rated doors where required. Deliver access doors for installation under Division 08. Mark each access door to accurately establish its location.
- C. Firestopping and Smokestopping: Provide in accordance with Division 07.
  - 1. Provide firestopping where wiring, conduit, or cable tray penetrates fire wall or floor.
  - 2. Provide smokestopping where wiring, conduit, or cable tray penetrates smoke barrier.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Mounting Heights: To center of device unless noted:
  - 1. Convenience outlets -----18" AFF unless noted otherwise
  - 2. Wall Switches -----4'-0" to top above floor
- B. Follow manufacturer's directions in all cases where manufacturers of articles used furnish directions covering points not shown or specified.
- C. Accurately set and level equipment with supports neatly placed and properly fastened. No allowance of any kind will be made for negligence on the part of the Contractor to foresee means of bringing in and installing equipment in position inside the building.
- D. Conduit System:

1. Work into complete integrated arrangement with like elements. Make work neat and finished appearing.
  2. Run concealed, except where shown otherwise. Where exposed run parallel with walls or structural elements with vertical runs plumb, horizontal runs level; groups racked together neatly with bends parallel and uniformly spaced. On existing walls run exposed using surface metal raceway.
- E. Provide hangers, supports, anchors and chases as required for installation of Electrical Work.
- F. Interface with other products:
1. For purposes of clarity and legibility, Drawings are essentially diagrammatic to the extent that many offsets, bends, special fittings, and exact locations of items are not indicated, unless specifically dimensioned. Exact routing of wiring, and locations of outlets, panels, and other items shall be governed by structural conditions or obstructions. Contractor shall make use of data in Contract Documents. In addition, Architect reserves right, at no increase in Contract Sum, to make any reasonable change in location of electrical items exposed at ceilings or on partitions to group them in orderly relationships or to increase their utility. Verify requirements in this regard prior to roughing-in.
  2. Take dimensions, location of doors, partitions, and similar features from Architectural Drawings. Verify at the Site under this Division. Consult Architectural Drawings for exact location of outlets, and other items to center with architectural features. Coordinate location of all ceiling mounted items with Division 09.

### **3.2 FIELD QUALITY CONTROL**

- A. Test panels and circuits for grounds and shorts with mains disconnected from feeders, branch circuits connected, and circuit breakers closed, all fixtures in place, permanently connected, grounding jumper to neutral lifted, and with all wall switches closed.

### **3.3 CLEANING**

- A. Properly prepare Work under this Division to be finish painted under Division 01.

### **3.4 EQUIPMENT IDENTIFICATION**

- A. Properly identify panelboards, circuit breakers in panelboards, disconnect switches, starters, and other apparatus used for operation or control of circuits, appliances or equipment.

### **3.5 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION**

- A. Comply with NECA 1.
- B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.

- C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.
- D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
- E. Right of Way: Give to piping systems installed at a required slope

### **3.6 FIRESTOPPING**

- A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for electrical installations to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 07 Section "Penetration Firestopping."

**END OF SECTION**

**SECTION 26 05 19  
ELECTRICAL CONDUCTORS AND CABLES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Building wires and cables rated 600 V and less.
  - 2. Connectors, splices, and terminations rated 600 V and less.
  - 3. Sleeves and sleeve seals for cables.

**1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Qualification Data: For testing agency.
- C. Field quality-control test reports.

**1.4 QUALITY ASSURANCE**

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

**1.5 COORDINATION**

- A. Set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

**PART 2 - PRODUCTS**

**2.1 CONDUCTORS AND CABLES**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:



1. Alcan Products Corporation; Alcan Cable Division.
  2. American Insulated Wire Corp.; a Leviton Company.
  3. General Cable Corporation.
  4. Senator Wire & Cable Company.
  5. Southwire Company.
- B. Copper Conductors: Comply with NEMA WC 70. Minimum size - No. 12 AWG. Stranded for sizes No. 8 and larger, solid for No. 10 and No. 12.
- C. Aluminum: Not permitted.
- D. Conductor Insulation: Comply with NEMA WC 70. Drawings are based on using THHN-THWN cables. Contractor shall increase conduit size for any other insulation.
- E. Ground Wire: Provide THWN ground wire in all circuits, sized per code. Raceway shall not be used as ground.
- F. Control and Low Voltage Cable: Cable shall be as recommended by manufacturer. Contractor shall coordinate location of plenums in building with all other trades. Provide plenum rated cable whenever cable passes through a plenum for the entire length.

## **2.2 CONNECTORS AND SPLICES**

- A. Splices and Terminations
1. 600 Volt
    - a. Splices: Solderless type only. Pre-insulated "twist-on" type permitted on solid conductor size number 10 and smaller. Hydraulic compression long barrel type with application preformed insulated cover, heat shrinkable tubing or plastic insulated tape for all stranded conductors. For stranded conductors provide terminations designed for use with stranded conductors.
    - b. Terminations: 250 kcmil and above – two-hole long barrel compression lugs. Below 250 kcmil – single-hole compression lug. Conductors No. 12 and smaller: provide eye or forked tongue compression lugs at bolted or screw connections - no lugs required for compression style terminal blocks.
    - c. Cable Ties: Nylon or accepted, locking type. Use a torque limiting tool for installation of ties.
  2. Control Cable Splices and Terminations
    - a. Splices: Pre-insulated crimp pigtail or butt splice connectors.
    - b. Terminations: Locking spade, insulated, compression lugs.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. AFC Cable Systems, Inc.

2. Hubbell Power Systems, Inc.
  3. O-Z/Gedney; EGS Electrical Group LLC.
  4. 3M; Electrical Products Division.
  5. Tyco Electronics Corp.
- C. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

### **PART 3 - EXECUTION**

#### **3.1 CONDUCTOR MATERIAL APPLICATIONS**

- A. Submit schedule of proposed aluminum wire for review. Contractor to increase conduit size to accommodate aluminum wire.

#### **3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS**

- A. Type THHN-THWN, single conductors in raceway.
- B. Branch Circuits: Type THHN-THWN, single conductors in raceway.
- C. Class 1 Control Circuits: Type THHN-THWN, in raceway.
- D. Class 2 Control and Low Voltage Circuits: Type THHN-THWN, in raceway, or as required by manufacturer. Plenum rated where required. Cable shall not be installed in slab or underground. All circuits shall be installed in raceway when installed in walls and non-accessible spaces.

#### **3.3 BRANCH WIRING**

- A. General: Complete system of conduit required to all light outlets, receptacles, switches, etc. as shown. Conduit size as shown on drawings, except where no size is shown, conduit shall be sized per National Electrical Code. No conduit shall carry more than 8 conductors. All exposed switches, receptacles or outlet boxes for other purposes, install die cast boxes, except where specifically noted otherwise. Feeder cables shall have each phase identified according to the established code.
- B. Coding: Branch circuit color code shall be: For 120/208 V. Black – Phase A, Red – Phase B, Blue – Phase C, White – Neutral, Green – Ground, Purple “Travellers” on 3 and 4 way switching. Where colors are not available (No. 4 and larger) all terminals shall be coded, both on the wire and on the terminal. Phase and neutral wires shall appear in the same position and rotation at all appearances.
- C. Separate neutrals shall be provided for all branch circuits. Shared neutrals are not allowed.

### **3.4 EQUIPMENT WIRING**

- A. General: Wiring connections for power and control for all equipment shall be complete including disconnect switches and controls unless otherwise specified or noted on drawings.
- B. Control wiring for mechanical systems installed under this section of specifications shall be in accordance with mechanical drawings and specifications.

### **3.5 INSTALLATION OF CONDUCTORS AND CABLES**

- A. Conceal cables in raceway in finished walls, ceilings, and floors, unless otherwise indicated.
- B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway.
- D. Exposed cables not permitted.
- E. Support cables according to Division 26 Section "Hangers and Supports for Electrical Systems."
- F. Identify and color-code conductors and cables according to Division 26 Section "Identification for Electrical Systems."

### **3.6 CONNECTIONS**

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
  - 1. Use oxide inhibitor in each splice and tap conductor for aluminum conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches of slack.

### **3.7 FIELD QUALITY CONTROL**

- A. Perform tests and inspections and prepare test reports.
- B. Tests and Inspections:

**LUTHER BURBANK PARK WATERFRONT IMPROVEMENTS**  
**SECTION 26 05 19**  
**ELECTRICAL CONDUCTORS AND CABLES**

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1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors, and branch conductors for compliance with requirements.
    - a. Megger Test
  2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
- C. Test Reports: Prepare a written report to record the following:
1. Test procedures used.
  2. Test results that comply with requirements.
  3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.
- D. Remove and replace malfunctioning units and retest as specified above.

**END OF SECTION**

**SECTION 26 05 26  
GROUNDING AND BONDING**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. This Section includes methods and materials for grounding.

**1.2 QUALITY ASSURANCE**

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

**PART 2 - PRODUCTS**

**2.1 CONDUCTORS**

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
  - 1. Solid Conductors: ASTM B 3.
  - 2. Stranded Conductors: ASTM B 8.
  - 3. Tinned Conductors: ASTM B 33.
  - 4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
  - 5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
  - 6. Bonding Jumper: Copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
  - 7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
- C. Grounding Bus: Rectangular bars of annealed copper, 1/4 by 2 inches in cross section, unless otherwise indicated; with insulators.

**2.2 CONNECTORS**

- A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.

- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, bolted pressure-type, with at least two bolts.
  - 1. Pipe Connectors: Clamp type, sized for pipe.
- C. Insulated Ground Conductors: Per 260519.
- D. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

### **PART 3 - EXECUTION**

#### **3.1 APPLICATIONS**

- A. Conductors: Install solid conductor for No. 10 AWG and smaller, and stranded conductors for No. 8 AWG and larger, unless otherwise indicated.
- B. Underground Grounding Conductors: Install bare tinned-copper conductor, No. 3/0 AWG minimum.
  - 1. Bury at least 24 inches below grade.
  - 2. Duct-Bank Grounding Conductor: Bury 12 inches above duct bank when indicated as part of duct-bank installation.
- C. Equipment Ground Conductors: Green colored insulation. Provide in all raceways.
- D. Conductor Terminations and Connections:
  - 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors or exothermic weld where required by code authority.
  - 2. Underground Connections: Welded connectors, except at test wells and as otherwise indicated.
  - 3. Connections to Ground Rods at Test Wells: Bolted connectors.
  - 4. Connections to Structural Steel: Welded connectors.

#### **3.2 GROUNDING**

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
  - 1. Feeders and branch circuits.
  - 2. Lighting circuits.
  - 3. Receptacle circuits.
  - 4. Single-phase motor and appliance branch circuits.

5. Three-phase motor and appliance branch circuits.
6. Flexible raceway runs.
7. Armored and metal-clad cable runs.

### **3.3 INSTALLATION**

- A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.
  1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
  2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install so vibration is not transmitted to rigidly mounted equipment.
  3. Use exothermic-welded connectors for outdoor locations, but if a disconnect-type connection is required, use a bolted clamp.
- C. Consult with code authority and comply with all code authority requirements.

**END OF SECTION**

**SECTION 26 05 29  
HANGERS AND SUPPORTS**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. This Section includes the following:
  - 1. Hangers and supports for electrical equipment and systems.
  - 2. Construction requirements for concrete bases.

**1.2 DEFINITIONS**

- A. EMT: Electrical metallic tubing.
- B. IMC: Intermediate metal conduit.
- C. RMC: Rigid metal conduit.
- D. IBC: International Building Code

**1.3 PERFORMANCE REQUIREMENTS**

- A. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- C. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.
- D. All supports shall comply with IBC, Washington Seismic Zone, Building Use Group III.

**1.4 SUBMITTALS**

- A. Product Data: For the following:
  - 1. Steel slotted support systems.
  - 2. Nonmetallic slotted support systems.
- B. Shop Drawings: Show fabrication and installation details and include calculations for the following:



1. Trapeze hangers. Include Product Data for components.
2. Steel slotted channel systems. Include Product Data for components.
3. Nonmetallic slotted channel systems. Include Product Data for components.
4. Equipment supports.

C. Welding certificates.

#### **1.5 QUALITY ASSURANCE**

- A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Comply with NFPA 70.

#### **1.6 COORDINATION**

- A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.
- B. Coordinate installation of roof curbs, equipment supports, and roof penetrations. These items are specified in Division 07 Section "Roof Accessories."

### **PART 2 - PRODUCTS**

#### **2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS**

- A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Allied Tube & Conduit.
    - b. Cooper B-Line, Inc.; a division of Cooper Industries.
    - c. ERICO International Corporation.
    - d. GS Metals Corp.
    - e. Thomas & Betts Corporation.
    - f. Unistrut; Tyco International, Ltd.
    - g. Wesanco, Inc.
  2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
  3. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
  4. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.

- 5. Channel Dimensions: Selected for applicable load criteria.
- B. Nonmetallic Slotted Support Systems: Not permitted.
- C. Raceway and Cable Supports: As described in NECA 1 and NECA 101.
- D. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- E. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.
- F. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- G. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
  - 1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
    - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - 1) Hilti Inc.
      - 2) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
      - 3) MKT Fastening, LLC.
      - 4) Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit.
  - 2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
    - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - 1) Cooper B-Line, Inc.; a division of Cooper Industries.
      - 2) Empire Tool and Manufacturing Co., Inc.
      - 3) Hilti Inc.
      - 4) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
      - 5) MKT Fastening, LLC.
  - 3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
  - 4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
  - 5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.

- 6. Toggle Bolts: All-steel springhead type.
- 7. Hanger Rods: Threaded steel.

## **2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES**

- A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- B. Materials: Comply with requirements in Division 05 Section "Metal Fabrications" for steel shapes and plates.

## **PART 3 - EXECUTION**

### **3.1 APPLICATION**

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.
- C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
- D. Secure raceways and cables to these supports with two-bolt conduit clamps.
- E. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

### **3.2 SUPPORT INSTALLATION**

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
- B. Raceway Support Methods: In addition to methods described in NECA 1, EMT may be supported by openings through structure members, as permitted in NFPA 70.
- C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.

- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
1. To Wood: Fasten with lag screws or through bolts.
  2. To New Concrete: Bolt to concrete inserts.
  3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
  4. To Existing Concrete: Expansion anchor fasteners.
  5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
  6. To Steel: Welded threaded studs complying with AWS D1.1/D1.1M, with lock washers and nuts.
  7. To Light Steel: Sheet metal screws.
  8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that meet seismic-restraint strength and anchorage requirements.
- E. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

### **3.3 INSTALLATION OF FABRICATED METAL SUPPORTS**

- A. Comply with installation requirements in Division 05 Section "Metal Fabrications" for site-fabricated metal supports.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- C. Field Welding: Comply with AWS D1.1/D1.1M.

### **3.4 PAINTING**

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Touchup: Comply with requirements in Division 09 for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.

- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

**END OF SECTION**

**SECTION 26 05 33  
RACEWAY AND BOXES**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

**1.2 DEFINITIONS**

- A. EMT: Electrical metallic tubing.
- B. ENT: Electrical nonmetallic tubing.
- C. EPDM: Ethylene-propylene-diene terpolymer rubber.
- D. FMC: Flexible metal conduit.
- E. IMC: Intermediate metal conduit.
- F. LFMC: Liquidtight flexible metal conduit.
- G. LFNC: Liquidtight flexible nonmetallic conduit.
- H. NBR: Acrylonitrile-butadiene rubber.
- I. RNC: Rigid nonmetallic conduit.
- J. RGS: Rigid galvanized steel
- K. PVC: Polyvinyl Chloride

**1.3 SUBMITTALS**

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
- B. Shop Drawings: For the following raceway components. Include plans, elevations, sections, details, and attachments to other work.
  - 1. Custom enclosures and cabinets.
  - 2. For handholes and boxes for underground wiring, including the following:
    - a. Duct entry provisions, including locations and duct sizes.
    - b. Frame and cover design.

- c. Grounding details.
  - d. Dimensioned locations of cable rack inserts, and pulling-in and lifting irons.
  - e. Joint details.
- C. Manufacturer Seismic Qualification Certification: Submit certification that enclosures and cabinets and their mounting provisions, including those for internal components, will withstand seismic forces defined in Division 26 Section "Vibration and Seismic Controls for Electrical Systems." Include the following:
  - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
    - a. The term "withstand" means "the cabinet or enclosure will remain in place without separation of any parts when subjected to the seismic forces specified."
  - 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
  - 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- D. Qualification Data: For professional engineer and testing agency.
- E. Source quality-control test reports.

#### **1.4 QUALITY ASSURANCE**

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

### **PART 2 - PRODUCTS**

#### **2.1 METAL CONDUIT AND TUBING**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. AFC Cable Systems, Inc.
  - 2. Alflec Inc.
  - 3. Allied Tube & Conduit; a Tyco International Ltd. Co.
  - 4. Anamet Electrical, Inc.; Anaconda Metal Hose.
  - 5. Electri-Flex Co.
  - 6. Manhattan/CDT/Cole-Flex.
  - 7. Maverick Tube Corporation.

- 8. O-Z Gedney; a unit of General Signal.
- 9. Wheatland Tube Company.
- B. Rigid Steel Conduit: ANSI C80.1.
- C. Aluminum Rigid Conduit: Not permitted.
- D. IMC: ANSI C80.6.
- E. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.
  - 1. Comply with NEMA RN 1.
  - 2. Coating Thickness: 0.040 inch, minimum.
- F. EMT: ANSI C80.3. Hot dipped galvanized inside and outside.
- G. FMC: Aluminum.
- H. LFMC: Flexible steel conduit with PVC jacket.
- I. Fittings for Conduit (Including all Types and Flexible and Liquidtight), EMT, and Cable: NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.
  - 1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886.
  - 2. Fittings for EMT: Steel, compression or set screw type.
  - 3. Coating for Fittings for PVC-Coated Conduit: Minimum thickness, 0.040 inch, with overlapping sleeves protecting threaded joints.
- J. Joint Compound for Rigid Steel Conduit or IMC: Listed for use in cable connector assemblies, and compounded for use to lubricate and protect threaded raceway joints from corrosion and enhance their conductivity.
- K. MC Cable: UL listed, copper cabling with ground wire and multiple circuits or neutrals as shown on the drawings. Aluminum or steel cladding, #12 copper minimum wire size

## **2.2 NONMETALLIC CONDUIT AND TUBING**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. AFC Cable Systems, Inc.
  - 2. Anamet Electrical, Inc.; Anaconda Metal Hose.
  - 3. Arnco Corporation.
  - 4. CANTEX Inc.
  - 5. CertainTeed Corp.; Pipe & Plastics Group.



6. Condux International, Inc.
7. ElecSYS, Inc.
8. Electri-Flex Co.
9. Lamson & Sessions; Carlon Electrical Products.
10. Manhattan/CDT/Cole-Flex.
11. RACO; a Hubbell Company.
12. Thomas & Betts Corporation.

- B. ENT: NEMA TC 13. Not permitted
- C. RNC: NEMA TC 2, Type EPC-40-PVC, unless otherwise indicated as PVC 80.
- D. LFNC: Not permitted.
- E. Fittings for Elbows and Sweeps shall be plastic coated rigid galvanized steel RNC: NEMA TC 3; match to conduit or tubing type and material.
- F. Fittings for LFNC: Not permitted.

## **2.3 METAL WIREWAYS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Cooper B-Line, Inc.
  2. Hoffman.
  3. Square D; Schneider Electric.
- B. Description: Sheet metal sized and shaped as indicated, NEMA 250, Type 1 or 3R when outside, unless otherwise indicated.
- C. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
- D. Wireway Covers: Hinged type.
- E. Finish: Manufacturer's standard enamel finish.

## **2.4 BOXES, ENCLOSURES, AND CABINETS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
  2. EGS/Appleton Electric.

3. Erickson Electrical Equipment Company.
  4. Hoffman.
  5. Hubbell Incorporated; Killark Electric Manufacturing Co. Division.
  6. O-Z/Gedney; a unit of General Signal.
  7. RACO; a Hubbell Company.
  8. Robroy Industries, Inc.; Enclosure Division.
  9. Scott Fetzer Co.; Adalet Division.
  10. Spring City Electrical Manufacturing Company.
  11. Thomas & Betts Corporation.
  12. Walker Systems, Inc.; Wiremold Company (The).
  13. Woodhead, Daniel Company; Woodhead Industries, Inc. Subsidiary.
- B. Sheet Metal Outlet and Device Boxes: NEMA OS 1. Minimum size: 4-inch by 4-inch by 1 ½-inch. Voice/data/AV boxes minimum 2 1/8-inch deep.
- C. Cast-Metal Outlet and Device Boxes: NEMA FB 1, aluminum, Type FD, with gasketed cover.
- D. Nonmetallic Outlet and Device Boxes: Not permitted.
- E. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- F. Cast-Metal Access, Pull, and Junction Boxes: NEMA FB 1, cast aluminum with gasketed cover.
- G. Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous-hinge cover with flush latch, unless otherwise indicated.
1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
- H. Cabinets:
1. NEMA 250, Type 1, galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
  2. Hinged door in front cover with flush latch and concealed hinge.
  3. Key latch to match panelboards.
  4. Metal barriers to separate wiring of different systems and voltage.
  5. Accessory feet where required for freestanding equipment.

## **2.5 SLEEVES FOR RACEWAYS**

- A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.
- B. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral water-stop, unless otherwise indicated.

- C. Sleeves for Rectangular Openings: Galvanized sheet steel with minimum 0.052- or 0.138-inch thickness as indicated and of length to suit application.
- D. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 07 Section "Penetration Firestopping."

## **2.6 SLEEVE SEALS**

- A. Basis-of-Design Product:
  - 1. Advance Products & Systems, Inc.
  - 2. Calpico, Inc.
  - 3. Metraflex Co.
  - 4. Pipeline Seal and Insulator, Inc.
- B. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and cable.
  - 1. Sealing Elements: EPDM interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.
  - 2. Pressure Plates: Carbon steel. Include two for each sealing element.
  - 3. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating of length required to secure pressure plates to sealing elements. Include one for each sealing element.

## **PART 3 - EXECUTION**

### **3.1 RACEWAY APPLICATION**

- A. Outdoors: Apply raceway products as specified below, unless otherwise indicated:
  - 1. Exposed Conduit: Rigid steel conduit.
  - 2. Concealed Conduit, Aboveground: Rigid steel conduit, IMC.
  - 3. Underground Conduit: Branch Circuitry Underground is not permitted except for runs installed on exterior or corridor walls. All other branch circuitry shall be run overhead or in walls RNC, Type EPC-40-PVC, direct buried with plastic coated RGS bends and sweeps.
  - 4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
  - 5. Boxes and Enclosures, Aboveground: NEMA 250, Type 4.
- B. Comply with the following indoor applications, unless otherwise indicated:
  - 1. Exposed, Not Subject to Physical Damage: EMT.
  - 2. Exposed and Subject to Severe Physical Damage: Rigid steel conduit. Includes raceways in the following locations:

- a. Loading dock.
- b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
- 3. Concealed in Ceilings and Interior Walls and Partitions: EMT. MC cable permitted in walls in room for branch circuiting only. ~~No~~ MC cable permitted for homeruns or connections between rooms when concealed.
- 4. In Slab or underground Conduit: Branch Circuitry Underground is not permitted except for runs installed on exterior or corridor walls. All other branch circuitry shall be run overhead or in walls RNC, Type EPC-40-PVC, direct buried with plastic coated RGS bends and sweeps. Branch Circuitry in second floor slab is not permitted except for runs installed on exterior or corridor walls and only where approved by structural engineer. All other branch circuitry shall be run overhead or in walls.
- 5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
- 6. Damp or Wet Locations: Rigid steel conduit.
- 7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4, stainless steel in damp or wet locations.
- C. Raceway Fittings: Compatible with raceways and suitable for use and location.
  - 1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.
  - 2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with that material. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer.
- D. Communications and Electronic Safety and Security: Shall be EMT overhead. Underground is not permitted except for connections between MDF and IDF's. See 260534.
- E. Install nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in nonmetallic sleeve.
- F. Do not install aluminum conduits in contact with concrete.
- G. No conduit shall contain more than 3 conductors plus neutrals and ground unless permitted or shown explicitly on drawings.

### **3.2 INSTALLATION**

- A. Raceway Sizes: When raceway is used all homeruns shall be minimum 1", branch circuitry  $\frac{3}{4}$ " minimum, runs that end in a single device may be  $\frac{1}{2}$ ". Note: where MC cable is acceptable these minimums do not apply.

- B. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.
- C. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- D. Complete raceway installation before starting conductor installation.
- E. Support raceways as specified in Division 26 Section "Hangers, Supports and Fasteners."
- F. Arrange stub-ups so curved portions of bends are not visible above the finished slab.
- G. Install no more than the equivalent of three 90-degree bends in any conduit run except for communications conduits, for which fewer bends are allowed.
- H. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.
- I. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
- J. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors, including conductors smaller than No. 4 AWG.
- K. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.
- L. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:
  - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
  - 2. Where otherwise required by NFPA 70.
- M. Flexible Conduit Connections: Use maximum of 72 inches of flexible conduit for recessed and semi-recessed lighting fixtures, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
  - 1. Use LFMC in damp or wet locations subject to severe physical damage.
  - 2. Use LFMC in damp or wet locations not subject to severe physical damage.
- N. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall.

### **3.3 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS**

- A. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 07 Section "Penetration Firestopping."
- B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.
- C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
- D. Rectangular Sleeve Minimum Metal Thickness:
  - 1. For sleeve cross-section rectangle perimeter less than 50 inches and no side greater than 16 inches, thickness shall be 0.052 inch.
  - 2. For sleeve cross-section rectangle perimeter equal to, or greater than, 50 inches and 1 or more sides equal to, or greater than, 16 inches, thickness shall be 0.138 inch.
- E. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.
- F. Cut sleeves to length for mounting flush with both surfaces of walls.
- G. Extend sleeves installed in floors 2 inches above finished floor level.
- H. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway unless sleeve seal is to be installed or unless seismic criteria require different clearance.
- I. Seal space outside of sleeves with grout for penetrations of concrete and masonry and with approved joint compound for gypsum board assemblies.
- J. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway, using joint sealant appropriate for size, depth, and location of joint. Refer to Division 07 Section "Joint Sealants" for materials and installation.
- K. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway penetrations. Install sleeves and seal with firestop materials. Comply with Division 07 Section "Penetration Firestopping."
- L. Aboveground, Exterior-Wall Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- M. Underground, Exterior-Wall Penetrations: Install cast-iron "wall pipes" for sleeves. Size sleeves to allow for 1-inch annular clear space between raceway and sleeve for installing mechanical sleeve seals.

**3.4 SLEEVE-SEAL INSTALLATION**

- A. Install to seal underground, exterior wall penetrations.
- B. Use type and number of sealing elements recommended by manufacturer for raceway material and size. Position raceway in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

**3.5 FIRESTOPPING**

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 07 Section "Penetration Firestopping."

**3.6 PROTECTION**

- A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.
  - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
  - 2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

**END OF SECTION**

**SECTION 26 05 53  
ELECTRICAL IDENTIFICATION**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Identification for raceway.
  - 2. Underground-line warning tape.
  - 3. Warning labels and signs.
  - 4. Instruction signs.
  - 5. Equipment identification labels.
  - 6. Miscellaneous identification products.

**1.3 SUBMITTALS**

- A. Product Data: For each electrical identification product indicated.
- B. Identification Schedule: An index of nomenclature of electrical equipment and system components used in identification signs and labels.
- C. Samples: For each type of label and sign to illustrate size, colors, lettering style, mounting provisions, and graphic features of identification products.

**1.4 QUALITY ASSURANCE**

- A. Comply with ANSI A13.1 and ANSI C2.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.145.

**1.5 COORDINATION**

- A. Coordinate identification names, abbreviations, colors, and other features with requirements in the Contract Documents, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual, and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.



- B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- C. Coordinate installation of identifying devices with location of access panels and doors.
- D. Install identifying devices before installing acoustical ceilings and similar concealment.

## **PART 2 - PRODUCTS**

### **2.1 RACEWAY IDENTIFICATION MATERIALS**

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.
- B. Color for Printed Legend:
  - 1. Power: White letters on a black field.
  - 2. Emergency Power: Black on red as dictated by inspector
  - 3. Fire Alarm: White on red.
  - 4. Legend: Indicate system or service and voltage, if applicable.
- C. Self-Adhesive Labels: Preprinted, laminated hard label with a clear, weather- and chemical-resistant coating.
- D. Snap-Around Labels for conduit: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeves, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- E. Snap-Around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeves, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- F. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; 2 inches wide; compounded for outdoor use.

### **2.2 CONDUCTOR AND COMMUNICATION- AND CONTROL-CABLE IDENTIFICATION MATERIALS**

- A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.
- B. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.
- C. Aluminum Wraparound Marker Labels: Cut from 0.014-inch- thick aluminum sheet, with stamped, embossed, or scribed legend, and fitted with tabs and matching slots for permanently securing around wire or cable jacket or around groups of conductors.

- D. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch, with stamped legend, punched for use with self-locking nylon tie fastener.
- E. Write-On Tags: Polyester tag, 0.015 inch thick, with corrosion-resistant grommet and polyester or nylon tie for attachment to conductor or cable.
  - 1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.

### **2.3 WARNING LABELS AND SIGNS**

- A. Comply with NFPA 70 and 29 CFR 1910.145.
- B. Self-Adhesive Warning Labels: Factory printed, Engraved, Laminated Acrylic or Melamine Label, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment, unless otherwise indicated. Minimum size = 1/4".
- C. Baked-Enamel Warning Signs: Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application. 1/4-inch grommets in corners for mounting. Nominal size, 7 by 10 inches.
- D. Metal-Backed, Butyrate Warning Signs: Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch galvanized-steel backing; and with colors, legend, and size required for application. 1/4-inch grommets in corners for mounting. Nominal size, 10 by 14 inches.
- E. Warning label and sign shall include, but are not limited to, the following legends:
  - 1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
  - 2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."

### **2.4 EQUIPMENT IDENTIFICATION LABELS**

- A. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with letters per above. Minimum letter height shall be 3/8 inch.

### **2.5 MISCELLANEOUS IDENTIFICATION PRODUCTS**

- A. Cable Ties: Fungus-inert, self-extinguishing, 1-piece, self-locking, Type 6/6 nylon cable ties.
  - 1. Minimum Width: 3/16 inch.
  - 2. Tensile Strength: 50 lb, minimum.
  - 3. Temperature Range: Minus 40 to plus 185 deg F.
  - 4. Color: Black, except where used for color-coding.

- B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

## **2.6 PANEL DIRECTORIES**

- A. Directory: Provide typewritten circuit directory on the inside of each panel door under plastic cover, identifying the type and location of every load. At lighting and receptacle circuits, indicate room numbers and names. All room numbers shall be as furnished by the Owner. All replaced or modified panels shall be provided with new directories.
- B. Identification: Spare circuits will be identified as such in pencil. Permanent room numbers, as furnished by owner, shall be used for location identification.

## **PART 3 - EXECUTION**

### **3.1 APPLICATION**

- A. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits More Than 30 A: Identify with orange self-adhesive vinyl label or snap-around label or self-adhesive vinyl tape applied in bands.
- B. Accessible Raceways and Cables of Auxiliary Systems: Identify the following systems with color-coded, self-adhesive vinyl tape applied in bands or snap-around, color-coding bands:
  - 1. Fire Alarm System: Red.
  - 2. Fire-Suppression Supervisory and Control System: Red and yellow.
  - 3. Telecommunication System: Blue.
  - 4. Control Wiring: Green and red.
- C. Power-Circuit Conductor Identification: For primary and secondary conductors No. 4 AWG and larger in vaults, pull and junction boxes, manholes, and handholes use color-coding conductor tape. Identify source and circuit number of each set of conductors. For single conductor cables, identify phase in addition to the above.
- D. Branch-Circuit Conductor Identification: Where there are conductors for more than three branch circuits in same junction or pull box, use aluminum wraparound marker labels. Identify each ungrounded conductor according to source and circuit number.
- E. Conductors to Be Extended in the Future: Attach marker tape to conductors and list source and circuit number.
- F. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Comply with 29 CFR 1910.145 and apply self-adhesive warning labels. Identify system voltage with black letters on an orange background. Apply to exterior of door, cover, or other access.

1. Equipment with Multiple Power or Control Sources: Apply to door or cover of equipment including, but not limited to, the following:
  - a. Power transfer switches.
  - b. Controls with external control power connections.
2. Equipment Requiring Workspace Clearance According to NFPA 70: Unless otherwise indicated, apply to door or cover of equipment but not on flush panelboards and similar equipment in finished spaces.

**G. Instruction Signs:**

1. Operating Instructions: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
2. Emergency Operating Instructions: Install instruction signs with white legend on a red background with minimum 3/8-inch- high letters for emergency instructions at equipment used for power transfer and load shedding.

**H. Equipment Identification Labels:** On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.

1. Labeling Instructions:
  - a. Indoor Equipment: Engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch- high letters on 1-1/2-inch- high label; where 2 lines of text are required, use labels 2 inches high.
  - b. Outdoor Equipment: Engraved, laminated acrylic or melamine label. Stenciled legend 4 inches high.
  - c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
2. Equipment to Be Labeled:
  - a. Panelboards, electrical cabinets, and enclosures.
  - b. Access doors and panels for concealed electrical items.
  - c. Emergency system boxes and enclosures.
  - d. Motor-control
  - e. Disconnect switches.
  - f. Enclosed circuit breakers.
  - g. Motor starters.
  - h. Push-button stations.
  - i. Contactors.

- j. Remote-controlled switches, dimmer modules, and control devices.
- k. Voice and data cable terminal equipment rough in
- l. Fire-alarm control panel and annunciators.
- m. Monitoring and control equipment.
- n. Junction boxes: System, voltage and circuit with black pen.

### **3.2 INSTALLATION**

- A. Verify identity of each item before installing identification products.
- B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- C. Apply identification devices to surfaces that require finish after completing finish work.
- D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.
- E. Attach nonadhesive signs and plastic labels with screws and auxiliary hardware appropriate to the location and substrate.
- F. System Identification Color Banding for Raceways and Cables: Each color band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.
- G. Color-Coding for Phase and Voltage Level Identification, 600 V and Less: Use the colors listed below for ungrounded conductors.
  - 1. Color shall be factory applied.
  - 2. Colors for 208/120-V Circuits:
    - a. Phase A: Black.
    - b. Phase B: Red.
    - c. Phase C: Blue.
    - d. Neutral: White
  - 3. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
- H. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.
- I. Painted Identification: Prepare surface and apply paint according to Division 09 painting Sections.

END OF SECTION

# **DIVISION 31**

# **EARTHWORK**

**SECTION 31 00 00**  
**EARTHWORK**

**PART 1 – GENERAL**

**1.01 SUMMARY OF WORK**

- A. Included in this Specification is excavation, subgrade preparation, backfilling, grading, and compaction as shown on the Drawings.
- B. Reuse of on-site material as Fill or Backfill is subject to approval by the Engineer as described in these Specifications. Physical and/or chemical characterization of excess materials may be required and will be provided by the City as determined by the Engineer.
- C. Portions of the work area include soil and/or groundwater contamination. Areas requiring special handling and disposal at a permitted disposal facility are described in these specifications.

**1.02 QUALITY ASSURANCE**

- A. Testing and Inspection for Contractor Quality Control: The Contractor shall perform the inspection and tests described below. Based upon the results of these inspections and tests, the Contractor shall take the action required and shall submit test reports. Testing shall be performed for each individual Work Area.
  - 1. Sampling and Testing of Materials
  - 2. Base Course Density
  - 3. Base Course Thickness
  - 4. Base Course Smoothness
  - 5. Controlled Density Fill
  - 6. Structure Backfill Density
  - 7. Subgrade Density
  - 8. Re-Use of Onsite Material

**1.03 GOVERNING CODES, STANDARDS AND REFERENCES**

- A. Washington State Department of Transportation (WSDOT) - Standard Specifications for Road, Bridge and Municipal Construction (current edition).
- B. Washington Administrative Code (WAC)
  - 1. WAC 173-303 Dangerous Waste Regulations
  - 2. WAC 173-340 Model Toxics Control Act – Cleanup
  - 3. WAC 2960842 Hazardous Waste Operations



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**1.04 SUBMITTALS**

- A. Contractor shall perform and submit gradation and test reports for all products specified in Part 2 of this specification. The Contractor shall also furnish manufacturer's technical literature, standard details, product specifications, and installation instructions for all products. Submittals shall include the following:
  - 1. Material sieve analysis.
  - 2. Weight per unit volume of uncompacted material.
  - 3. Specific gravity of material as determined from absolute volume, in accordance with ASTM D854.
  - 4. Compaction Control Testing for subgrade and backfill as required per PART 3 of this section.
  - 5. Proctor test results.
  - 6. Gradation and Proctor testing reports of onsite material proposed to be reused as backfill material.
- B. Submit a Soils Management Plan prior to dewatering and excavation with a description of the proposed plan for:
  - 1. Excavation, handling, hauling, stockpiling, and segregation of soil.
  - 2. Backfilling.
  - 3. Intended stockpile location(s).
  - 4. Sequencing and scheduling of work in the Contractor's Work Area throughout construction.
  - 5. Contaminated Soil Handling and Management Plan.
  - 6. Haul route to the disposal or transfer facility and return to the site.
- C. Controlled Density Fill (CDF) – mix design and compressive strength results from actual testing of the proposed mix design.
- D. Woven Geotextile – material properties as described herein.
- E. Copies of all necessary permits or approvals from regulatory agencies, and from state and local governments.
- F. Landfill trip tickets and weigh scale tickets (reporting tons) shall be submitted to the Design Professional for import aggregates indicated in the schedule of unit prices. Tickets shall be submitted within 2 days of delivery or export.

**1.05 JOB CONDITIONS**

- A. Excavation materials shall be excavated, hauled, and disposed of according to permit and all related laws and regulations. Available stockpiling areas within the established Work Area (as shown in the Drawings) are limited. Contractor shall coordinate export haul and import delivery of materials to minimize truck queuing on public streets.

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- B. Existing Utilities: The Contractor shall locate existing underground utilities in the area of the Work. Those utilities which are to remain shall be adequately protected from damage.
  - C. Dewatering: Dewatering shall be performed for all excavations below groundwater. See Section 31 23 19 – Dewatering.
  - D. This work shall include the excavation, protection, hauling, and disposal of petroleum-contaminated soils.
  - E. Petroleum-related contaminants are present at the site at levels that require special handling, storage, and disposal methods. All soil near the boiler building shall be assumed to be contaminated until otherwise confirmed by analytical testing and approved by the Engineer. The Contractor shall review the environmental information and be familiar with site contaminant characteristics and associated chemical hazards. Refer to the RI/FS/CAP Report for environmental data, boring logs, and monitoring well logs for descriptions of the nature and extent of contamination, provided in Appendix B.

#### **1.06 ALTERNATIVES**

- A. Recycled concrete or recycled concrete pavement shall not be allowed for aggregate in backfill material.

#### **1.07 HEALTH AND SAFETY**

- A. Contractor shall comply with the health and safety requirements as identified in Section 00 73 18 35 29 – Health and Safety Requirements
- B. Contractor shall comply with applicable WISHA and OSHA health and safety standards, which includes developing a site specific health and safety plan. Employ workers that have received health and safety training and medical monitoring, as required in Chapter 296-62 WAC and General Occupational Health Standards as required in Chapter 296-24 WAC, and in accordance with OSHA and WISHA. Construction activities that pose a potential risk of exposure to contaminated soil or dust must be supervised by personnel who have current 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) certification and 8-hour HAZWOPER Supervisor certification. All personnel working in direct contact with contaminated soil shall have current 40-hour HAZWOPER waste certification.

### **PART 2 – PRODUCTS**

#### **2.01 GENERAL**

- A. Materials shall be of the quality, size, shape, gradation or equal to the manufacturer as specified herein.

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**2.02 BACKFILL**

- A. Select Fill shall meet the requirements for Crushed Surfacing Top Course Bedding in accordance with WSDOT Standard Specification 9-03.9(3) or as directed by Design Professional.
- B. Reuse of excavated on-site material may be used for utility trench backfill in areas of landscaping. Reuse material shall be screened to remove deleterious materials, including wood, organic waste, coal, charcoal, and any other extraneous or objectionable materials. Contractor shall screen rocks larger than 10 inches in diameter prior to reuse as backfill.
- C. Gravel for Foundations shall meet the requirements of crushed surfacing base course in accordance with WSDOT Standard Specifications 9-03.9(3).
- D. When temporary shoring is removed from around the underground manholes, catch basins, lift stations or other underground structures, the resulting void or disturbed soil zone from behind the shoring to the face of the structure shall be backfilled and compacted to 95 percent density. In the event density cannot be achieved, the void shall be backfilled with CDF.

**2.03 UTILITIES BEDDING**

- A. Utility bedding shall meet the requirements for Crushed Surfacing Top Course Bedding in accordance with WSDOT Standard Specification 9-03.9(3).

**2.04 PERMEABLE BALLAST**

- A. Permeable ballast shall meet the requirements of WSDOT Standard Specifications 9-03.9(2).

**2.05 UNDERGROUND MARKING TAPE**

- A. Underground marking tape shall consist of inert polyethylene plastic, 4-mil thickness that is impervious to all known alkalis, acids, chemical reagents and solvents likely to be encountered in the soil, with a metallic foil core to provide the most positive detection and pipeline locators.
- B. The tape shall be color coded and shall be imprinted continuously over its entire length in permanent black ink. The message shall convey the type of line buried below and shall also have the word "Caution" prominently shown. Color coding of the tape shall be as follows:

UTILITY	TAPE COLOR
Water	Blue
Sewer	Green

Electrical	Red
Gas-Oil	Yellow
Telephone-CATV	Orange
Irrigation	Purple

- C. The width of the tape shall be as recommended by the manufacturer for the depth of installation.

## **2.06 GEOTEXTILE FABRIC**

- A. Geotextile fabric shall be Mirafi 600X, U.S. Fabrics 315, Or Approved Equal, and have the following properties:

Grab Tensile Strength	315lb min.
Puncture Strength	112lb min.
Apparent Opening Size (AOS)	#40 sieve

## **2.07 CDF BACKFILL**

- A. Control Density Fill (CDF) shall contain a minimum of 94 lb. Type 1 cement per cubic yard. The CDF shall be flowable mix with a maximum aggregate size of 3/8".

## **2.08 CHARACTERIZATION TESTING, REPORTING, AND CERTIFICATION OF OFF-SITE MATERIAL**

- A. The Contractor shall provide characterization and testing as described below for off-site materials.
- B. The Contractor is responsible for all testing costs associated with characterization of off-site borrow materials.
- C. The Contractor shall provide the following information with each sample submitted:
1. Material Source
  2. Proposed On-site Use
  3. Sampling dates
  4. Chain of custody
  5. Sampling locations
  6. Contractor's certification that the samples submitted are representative of the materials that shall be used at the site.
- D. Characterization Testing shall include:
1. Physical Properties:
    - a. Grain Size Distribution (ASTM D 422-63)

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- b. Maximum Dry Density (ASTM D1557)

## **2.09 PETROFIX**

- A. Manufacturer: Regenesis
- B. Product: PetroFix® remedial fluid with PetroFix: Electron Acceptor Blend

## **PART 3 – EXECUTION**

### **3.01 EXECUTION OF WORK**

- A. Excavating and grading of naturally occurring materials, whether native to the site or imported, which is made as part of this Contract, shall be removed, or placed within the tolerances established or within reasonably close conformity with the alignment and grade indicated on the Drawings or as established by the Design Professional.
- B. Existing Utilities: The Contractor shall locate existing underground utilities in the area of the Work. Those utilities which are to remain shall be adequately protected from damage. The Contractor shall repair any partial or complete backfilled area that loses stability because of continued hauling across it. The Contractor shall also change hauling equipment or procedures to prevent further damage.
- C. Unauthorized excavation consists of removal of materials beyond indicated Limits shown on the Drawing without specific direction of the Design Professional. Unauthorized excavation shall be at no change in contract amount.
- D. Conduct all required activities associated with excavation, stockpiling, and disposal of soil and debris in accordance with the requirements of the Contract Documents and as directed by the Design Professional. Coordinate with the City and Design Professional to limit adverse effects of the work on the activities of other adjacent areas and/or the public.
- E. Implement environmental protection measures, site access and traffic control, utility protection, air emissions control, dust control, drainage, erosion and sedimentation control, spill prevention and pollution control, noise control, and all other controls needed to protect environmental quality during the work.

### **3.02 TRANSPORTATION AND DISPOSAL OF WATER MATERIAL**

- A. The Contractor shall be solely responsible for proper loading and compliance with all applicable load and weight limits for vehicles leaving the Project site, and for any fines, taxes, penalties, or judgments resulting from overweight or improperly loaded vehicles.
- B. Cleanup Action Excavation Soil Loading and Hauling
  - 1. The Contractor shall provide all labor, equipment, materials and facilities necessary to load contaminated or impacted materials into containers or trucks, as appropriate.

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- Contractor shall prepare and load all containers or trucks for transport and disposal of materials excavated from the site as specified in this section.
2. Contractor shall obtain all required transportation permits for shipment of non-hazardous impacted soil and debris.
  3. The Contractor shall be solely responsible for proper loading and compliance with all applicable load and weight limits for vehicles leaving the site. All fines, taxes, penalties, or judgments resulting from overweight or improperly loaded vehicles shall be the sole responsibility of the Contractor.
  4. Waste containing free liquids shall be treated, at the Contractor's sole expense, to meet disposal facility acceptance requirements.
  5. Soil exported from the site shall meet moisture content requirements per EPA Paint Filter Liquids Test Method 9095B, necessary to legally transport material on public roadways, and be accepted for disposal. Contractor shall provide truck liners as necessary to ensure that materials are not released after exiting the Work Areas
  6. By the end of each hauling day, the Contractor shall notify the Design Professional and City of the number of trucks hauled and the approximate volume (truck cubic yards) of material handled per truck. This information shall be recorded in the daily project records.
  7. Prior to leaving the site, the Contractor shall visually inspect each haul truck to ensure that tailgates and tarpaulins are secure. The Contractor shall decontaminate the exterior of all vehicles and containers, as necessary, in compliance with applicable regulations.
  8. Load weights shall be documented by the receiving facility (transfer station) using certified scale weight tickets. The Contractor shall submit original, signed weight tickets to the City within 24 hours of receipt. Unsigned or late-submitted tickets will be rejected, and payment will not be made based on those weights.
  9. The Contractor shall coordinate with the disposal facility regarding delivery, staging, and unloading of containers, if utilized..

### **3.03 EXCAVATION**

- A. Common Excavation: Shall be the naturally occurring earth, sand, gravel, clays, or mixtures of the above, required to be moved for the construction of pathways, trails, rock terraces, access roadways, general sloping and associated Work which is not otherwise designated as "Structure Excavation," "Unsuitable Excavation," "Trench Excavation," etc., which may appear in Section 01 22 00 Unit Prices. Common excavation material shall be moved with the use of mechanical equipment, such as shovels, loaders, bulldozers, graders, rippers, etc., but shall not require drilling and blasting or drilling and line breaking. Excavation by sluicing method will not be permitted unless specifically approved by the Design Professional. In general, common excavation shall be removed in horizontal layers in such a

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way that the resulting material will be a reasonable blend of the naturally occurring materials.

- B. Unsuitable Excavation: Shall consist of unstable materials, such as peat, muck, water-impregnated clays, swampy or other undesirable materials, including buried logs, stumps, or trash.
  - 1. Unsuitable materials beneath structures, vaults, and pavement shall be removed to the depth designated by the Design Professional.
  - 2. Unsuitable material excavated shall be replaced with Select Backfill.
- C. Structure Excavation: Shall consist of excavating, removing and placement or disposing, as required, of all formations and materials, natural or man-made, irrespective of nature or condition, encountered within the limits defined, necessary for the construction of the foundations for sanitary sewer structures, vaults, stormwater structures, or other structures indicated on the drawings. The excavation shall be accomplished in accordance with the specification requirements and may include incidental Work including, but not limited to, removal of structures or portions thereof; grubbing of structure site which would not otherwise be grubbed; construction and subsequent removal of shoring, cribs, cofferdams, or caissons; pumping or dewatering of excavated areas; protection of excavated materials from the weather; and placement and compaction backfill.
- D. The material obtained from structure excavation shall be screened and disposed of as directed by the Design Professional.
  - 1. Excavation below the designed footing depth, unless directed by the Design Professional, shall be backfilled with concrete at no cost to the City.
- E. Trench Excavation: Shall be accomplished to the lines and grades designated by the Design Professional, with the neat lines shown in the Drawings. Trench excavation shall consist of the removal, placement, or disposal of all formations as described above in "Structure Excavation." The inclusions and exclusions stated above shall apply equally to "Trench Excavations" as well as "Structure Excavation." Prior to placing any utility piping, conduit, etc., the trench shall be cleaned of all unsuitable material, backfilled with the specified bedding material and approved by the Design Professional.
- F. All costs incidental to excavation beyond the limits of structure or trench excavation shall be at the Contractor's expense.
- G. Cleanup Action Excavation
  - 1. The Contractor shall provide all labor, equipment, materials, and facilities necessary to excavate and load petroleum contaminated materials into containers or trucks for disposal.
  - 2. The Contractor shall prepare and load all containers or trucks for transport and disposal of materials excavated from the site, as specified in this section.
  - 3. The Contractor shall coordinate transportation and disposal of contaminated soil.

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4. Soil and material from the cleanup action excavation shall be direct-loaded for transportation and disposal. Stockpiling of contaminated material is not permitted unless directed by the Design Professional or City.
  5. If excavated soil and materials are temporarily stockpiled, then the Subcontractor shall implement appropriate stockpile TESC BMPs and in accordance with Section 3.10 Stockpiling.
  6. All stockpiled excavation materials on site shall be continuously and clearly identified on a current site plan, including the excavation source location and observed contamination levels. The Contractor shall remove stockpiled contaminated soil from the site as soon as possible following authorization by the Design Professional or City.
  7. The Contractor shall provide access, as necessary, to the Design Professional or City for soil and/or groundwater sampling within the Cleanup Action Excavation Plan limits.
  8. While sampling is being performed, the Contractor may be required to suspend work or shift operations to other areas while awaiting chemical analytical results. Time required for laboratory testing shall be included in the Project Schedule. The Contractor shall maximize project efficiency by modifying work plans, as necessary, to avoid delays as logistical issues arise. The Contractor shall keep the Owner's Representative informed regarding standby costs and the most efficient means to avoid such costs.
  9. The Design Professional or City Representative may request additional excavation to remove contaminants if samples exceed regulatory requirements. The extent of over-excavation shall be determined by the Design Professional or City. Costs associated with over-excavation of contaminated soil shall be reimbursed per. Over-excavation soil shall be stockpiled and disposed of separately from other material. Any excavation beyond that necessary for construction and contaminated soil removal, unless otherwise ordered by the Design Professional in writing, shall not be paid for. Unauthorized over-excavated areas shall be filled with Select Fill, placed, and compacted at the Contractor's expense.
  10. If excavated soil contains free liquids, the Contractor shall stabilize the soil using bentonite or fly ash in quantities sufficient to control the liquid as necessary for transport and disposal. Bentonite or fly ash shall be introduced and mixed within the excavation and/or dump truck. Mixing stabilizing agents directly into a stockpile may only be conducted with approval from the Design Professional or City.
  11. The Contractor shall maintain a 2 foot horizontal offset from the face of existing structures during all remedial excavation activities. Temporary remedial excavation inclinations must not be steeper than 1.5 Horizontal to 1.0 Vertical unless otherwise approved by the Design Professional. If remedial excavation activities expose foundations or other elements of existing structures, do not proceed with excavation



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and notify the Design Professional. Do not remove relic structures or improvements from the remedial excavation area unless directed by the Design Professional.

### **3.04 BACKFILL**

- A. Backfill beyond the limits defining structure excavation shall be made of backfill material obtained from a source other than the excavated material.
- B. Water existing in the excavated area shall be removed by pumping or other means before backfilling.
- C. Place structure backfill in horizontal layers not exceeding eight inches in loose thickness and compact each layer to 95 percent of the maximum density. Grade the backfill flush with existing ground or as directed by the Design Professional.
- D. Do not place backfill against any concrete structure until the concrete has set and cured at least 21 days unless otherwise authorized by the Design Professional.
- E. All costs incidental to furnishing backfill, backfilling and compacting backfill beyond the limits defining structure or trench excavation shall be at the Contractor's expense.
- F. Backfill trenches with bedding material as specified and as called for on the Drawings. Fine-grade the bedding material to the required slope and excavate to accommodate bell and spigot joints so the entire length of each pipe will be uniformly supported. Trench backfill shall be common material placed in horizontal layers not to exceed eight inches in loose thickness and carefully compacted by the use of small vibratory or mechanical compactors until the cover is one foot above the top of the pipe. Subsequent layers of trench backfill shall not exceed eight inches in loose thickness but may be compacted by any method which will not exceed the allowable stresses for the pipe. Each layer shall be compacted to 95 percent of maximum density.

### **3.05 GRADING TOLERANCES**

- A. The subgrade of the entire area shall be graded within a tolerance of  $\pm 0.03$  feet in 10 feet, ready for crushed rock base wherever pavement is to be furnished.

### **3.06 UNDERGROUND MARKING TAPE**

- A. The Contractor shall provide an approved underground marking tape to mark all underground utility and conduit lines installed as part of this Contract. The underground marking tape shall extend the full length of each such line and shall be placed one foot above each line.

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**3.07 COMPACTION**

- A. Compaction shall be performed with approved compaction equipment suited to the soil being compacted. Moisten or aerate material as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction with the equipment used. Compact the total area of backfill concurrently. In areas of limited access, as determined by the Design Professional, compact the backfill by using hand or hand-operated power tampers. While backfill is being placed in layers, operate the compaction equipment continuously. Each lift of material placed shall be uniformly compacted to the density indicated for the specific material and use set forth in these Specifications. The percent of density required is in relation to the maximum density obtainable at optimum moisture content (Compaction Control Density) as determined in Article "Compaction Control Tests," these Specifications.

**3.08 COMPACTION CONTROL TESTS**

- A. Laboratory and field tests shall be performed in accordance with the applicable provisions of Section 01 45 43 – Special Inspections and Testing to determine compliance with these Specifications.
- B. Compaction control density shall be the maximum dry density at optimum moisture content as determined by ASTM D1557, Standard Methods for Moisture-Density Relationships of Soil and Soil Aggregates, Methods B or C as applicable.
- C. Field tests to determine in-place compliance with required densities as specified, shall be performed in accordance with ASTM D1556, D2167 or D2922.

**3.09 SURVEY**

- A. The Contractor shall provide for all survey needs on this project as identified in these Specifications or as required to complete the work. Any Contractor surveying shall be incidental to all work outlined in these Specifications and shown on the Drawings; there is no separate pay item for surveying.

**3.10 STOCKPILING**

- A. All excavated materials, regardless of type and stockpile location, shall be protected from contamination by other materials and from the weather by covering with plastic sheeting or by other means. See Section 01 57 13 – Temporary Erosion and Water Management and the Temporary Erosion and Sediment Control Drawings for additional requirements.
- B. General Stockpile Requirements: The Contractor shall locate stockpiles as necessary within the Work Area limits as shown on the Drawings to complete the work. No stockpiles may be located below the ordinary high-water line as shown on the Drawings, or in such a

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manner as to impair access to adjacent sites or facilities or be detrimental to work progress or the completed work in any way. Stockpile locations and configurations must be approved by the City and Design Professional.

1. All stockpile areas shall be sized to accommodate anticipated volumes and rates of excavation, import, and recycling segregation.
2. All stockpiles shall be covered and bermed as shown on the Drawings. Weather-resistant sheeting or other suitable means shall be used to protect stockpiles when stockpiles are not in use, and to prevent precipitation and other materials from contacting the stockpiles. The stockpile covers shall be anchored to prevent them from being removed by wind as shown on the Drawings. Stockpile berms or enclosures shall be maintained in good condition and constructed of materials that are compatible with the material to be stored. Vehicle access points to the stockpiles shall also be bermed. Alternatively, ecology blocks may be placed around stockpiles to serve as berms, except at vehicle access points. The Contractor shall repair or replace torn covers immediately.
3. The Contractor shall be responsible for any necessary dewatering of excavated materials.
4. The Contractor shall minimize potential contact of stormwater runoff and precipitation with stockpiles through best management practices, including diverting precipitation falling on the stockpile covers to outside the stockpile areas.
5. The Contractor shall inspect all stockpile areas daily and after rain events and shall maintain a written inspection log. The inspection log shall be available at the request of the City or Design Professional and submitted with the Contractor's monthly reports. Inspection logs shall contain date and time of inspection, name of individual conducting the inspection, observations, problems noted, and corrective actions taken. For each stockpile, the log shall note the material present; dates that the stockpile was established or modified; daily volumes based on visual or other estimates; condition of the stockpile covers, berms, and liners where visible; presence and estimated volumes of stockpile drainage water; and sump condition as applicable. The log shall also note dates that stockpiles are shipped for off-site disposal or relocated on-site. The log shall establish a sequential numbering system for each stockpile.

### **3.11 WASTE MANAGEMENT AND DISPOSAL**

- A. Contaminated soil and materials shall not be reused on site and shall be disposed of at a Resource Conservation and Recovery Act (RCRA) Subtitle D facility permitted to accept petroleum-contaminated soil. The Contractor shall identify proposed soil disposal facility(ies) in the Contaminated Soil Handling and Management Plan and shall be responsible for profiling and obtaining acceptance of the material by the facility. Available

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environmental data are provided in the RI/FS/CAP Report (Appendix B). Any additional testing required for disposal facility acceptance shall be the responsibility of the Contractor.

- B. The Contractor shall prepare and provide the City with original receipts, waste manifests, and weight tickets for each shipment of contaminated or impacted waste removed from the site. Weight, rather than volume, shall be used to measure waste quantities for manifesting and payment purposes.
- C. Waste manifests or other approved tracking documents shall be provided to the Design Professional for each individual load. Each manifest shall be signed by a designated authorized agent of the City as shipper, by the truck driver as transporter, and by the landfill or other designated off-site facility operator (e.g., transfer station). The Contractor shall not be paid for shipments with unsigned manifests or bills of lading.
- D. Tracking racking documents shall be provided to the Engineer within three (3) working days of disposal.

### **3.12 SITE CLEANUP AND MANAGEMENT OF WASTE MATERIALS**

- A. The Contractor shall be responsible for the disposal of all excess soils and those that the Design Professional determines to be Excess Material. The excess soils shall be disposed at a location permitted to receive the type of excess soils to be disposed. Prior to removing from the site, the Contractor shall coordinate with the Owner's Representative for testing of the material. The Owner's Representative will test the material prior to disposal. Costs associated with handling and disposal of non-regulated excess soils shall be included in the Contractor's base bid for the project.
- B. The Contractor shall be responsible for preventing the offsite movement of all waste materials, spills, etc., resulting from the work under this Contract, and shall be responsible for any consequences of any such offsite movement of material.
- C. Incidental Contaminated Waste Disposal
  - 1. The Contractor shall be responsible for the on-site and off-site management and disposal of all incidental wastes generated by the Contractor as a result of handling contaminated soil and groundwater. Incidental contaminated materials may include, but are not limited to, personal protective equipment (PPE), decontamination water, erosion and sediment control materials, residual soil samples, and other materials (e.g., plastic sheeting, wash basins, scrub brushes, rags) that have come into contact with contaminated media.
  - 2. Decontamination Water: The Contractor shall collect, manage, and dispose of all decontamination water generated during decontamination of personnel and equipment on site. Decontamination water shall be collected and stored in a designated secure area and, if contaminated, shall be handled in the same manner as dewatering water.

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- D. The Contractor shall return stockpile areas to original conditions on completion of use.
  - E. The Contractor shall clean up soil tracked from the site onto public roadways on a daily basis or more frequently, as directed by the Owner's Representative.

### **3.13 PETROFIX**

- A. Handle and store products per manufacturer's recommendations.
- B. Petrofix shall be field mixed per manufacturers requirements and to the following dilution factor or as directed by the Design Professional
  - 1. Dilution Factor: 4X
- C. The mixed solution of PetroFix with associated Electron Acceptor Blend shall be mixed in an onsite storage tank sized to hold the full mixed volume or as directed by the Design Professional. Holding tank shall be equipped with a recirculation pump. Minimum project requirements for mixture:
  - 1. Petrofix: 1,200 pounds
  - 2. Electron Acceptor Blend: 60 pounds
  - 3. Water Volume: 368 gallons
- D. Mixture shall be applied to the excavation using a minimum 1.5-inch diameter hose with 1.5-inch diameter fire nozzle.
- E. The diluted mixture shall be applied to the excavation bottom and sidewalls in accordance with the manufacturer's direct application guidelines. The applied PetroFix shall be a minimum of 1.4 inches thick and shall be applied to the entire excavation base and any sidewalls where residual contamination has been documented by the Design Professional. Additional PetroFix may be applied if excavation beyond the planned limits is required.
- F. The Design Professional shall observe and document PetroFix mixing and shall provide written approval of the final mixed product prior to application.
- G. Backfilling of the excavation shall not commence until the Design Professional has inspected and approved the PetroFix application extent and thickness in writing.

**END OF SECTION**

**SECTION 31 11 00**  
**CLEANING, GRUBBING, AND CLEANUP**

**PART 1 – GENERAL**

**1.01 SUMMARY OF WORK**

- A. The extent and location of the “Clearing, Grubbing and Cleanup” Work is indicated on the Contract Documents. The Work is to be accomplished by removing and disposing of all trees, brush, down timber, stumps, roots, rubbish and debris, except such objects as are designated to remain or are to be removed in accordance with other Sections of these specifications. The Work also includes preservation from damage or defacement of trees, bushes, shrubs, or other objects designated to remain as indicated on the Drawings.

**PART 2 – MATERIALS**

Not Used.

**PART 3 – EXECUTION**

**3.01 EXECUTION OF WORK**

- A. Clearing
  - 1. Within areas of grading and clearing as indicated in the Drawings unless otherwise noted all trees, brush, logs, upturned stumps, roots of downed trees, rubbish and debris shall be removed and disposed of legally off-site.
    - a. Fell all trees as indicated in the Drawings for removal.
    - b. All stumps left in the cleared area outside the excavation stakes, and which are not to be grubbed, shall be close-cut parallel to the slope of the ground.
    - c. Trees and native shrubbery indicated on the Drawings to remain or designated by the Owner’s Representative shall be left standing, and care shall be exercised by the Contractor not to damage such trees and shrubbery.
    - d. Trees and shrubs designated to be trimmed shall be trimmed to such height as may be designated by the Owner’s Representative, branches shall be neatly cut close to the tree trunk. All tree trimming shall be observed by an International Society of Arboriculture certified arborist. Cut or scarred surfaces of trees or shrubs shall be painted with an approved tree wound dressing.
    - e. Clumps of native shrubbery shall be thinned where designated and directed by the Owner’s Representative.

- f. Trees and shrubbery shall be fenced for the duration of the project as indicated in the Drawings.

**B. Grubbing**

- 1. Perform grubbing where indicated on the Drawings or designated by the Owner's Representative. Remove from the ground all stumps, roots, buried logs and other vegetation of a decomposable nature.
- 2. Grub all areas of excavation, and all other areas indicated on the Drawings.
- 3. Within the limits of grubbing, grubbing shall be to the depth necessary to remove all stumps, large roots, buried logs and other objectionable material unless otherwise noted in the Drawings.
- 4. Dispose of the refuse resulting from the grubbing operations legally off-site.

**C. Cleanup**

- 1. Cleanup consists of the following work not otherwise provided for in the Contract Documents:
  - a. Removal outside of the clearing and grubbing of trees, snags, down timber, upturned stumps, large rocks and boulders, and all unsightly foreign materials and objects.
  - b. Selective thinning of trees and brush.
  - c. Filling of holes and smoothing and contouring of the ground.
  - d. Obliteration of existing improvements to be abandoned and reshaping of the areas to blend naturally with the existing terrain.
- 2. Sufficiently in advance of completion of other work of the project, allowing time to do cleanup, the Contractor and the Design Professional shall arrange for a joint inspection of the Project for determination of cleanup to be completed. Accomplish the work by methods and equipment as necessary and as approved by the Design Professional.
- 3. Dispose of the excess material and debris resulting from the operation.

**D. Disposal**

- 1. All materials upon their demolition shall be removed and promptly disposed of as specified in Section 02 41 13 – Site Demolition . No material shall be disposed of in adjoining waterways or in the fill. Burning of materials is forbidden under all circumstances.

**END OF SECTION**

**SECTION 31 23 19  
DEWATERING**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. Extent of Work: The work for “Dewatering” includes the requirements for designing, furnishing, installing, maintaining, operating, monitoring and decommissioning a temporary construction dewatering system(s) and controls as required to control water levels and subsurface uplift hydrostatic pressures during the Work. The Work also includes monitoring water quantity and quality, treatment and disposing of pumped or hauled water; constructing, maintaining, observing, and removing the equipment and instrumentation when no longer needed.
- B. Construction dewatering includes intercepting, pumping, monitoring, and treatment of seepage and hydrostatic head. Groundwater is influenced by lake and groundwater levels and are expected to seasonally fluctuate.
- C. The Owner has applied for coverage under the Construction Stormwater General Permit (CSGP) from the Washington State Department of Ecology (Ecology) for temporary discharge of dewatering and erosion and sediment control water. Once received, the CSGP documents and associated Administrative Order (AO) will be transferred to the Contractor prior to construction Notice to Proceed. For discharge criteria, see Section 01 57 13 – Temporary Erosion And Sediment Control Planning And Execution.
- D. The following is a list of reference documents for use by the Contractor, but shall not be considered exclusive for the design and implementation of the dewatering system. The Contractor shall review the following reports in the Appendices that are site specific:
  - 1. Geotechnical Engineering Design Study.

**1.02 DESCRIPTION OF WORK**

- A. Design Guidelines
  - 1. The Contractor shall be responsible for the design and adequacy of the methods and systems to accomplish the following:
    - a. Dewatering shall be used to lower the groundwater level to at least 2 feet below the bottom level of excavation, but no greater than 4 feet below the bottom of excavation, for the duration of the excavation and as required to meet backfill criteria.
    - b. Dewatering shall be used to provide a substantially dry and stable subgrade and sidewalls for the execution of surveying and backfilling.



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- c. Prevent damage to adjacent buildings, structures, utilities, and other work that may result from settlement or other groundwater-related effects. The Dewatering Plan shall be submitted for review.
  - d. Baseline measurements for survey monitoring for settlement and groundwater elevations shall be established prior to installation of shoring and dewatering and shall continue for the duration of dewatering on regular intervals. Monitoring shall be performed daily for groundwater elevations and three times per week for settlement monitoring and shall be increased or decreased as directed by the Design Professional.
- 2. The methods for dewatering shall be at the Contractor's discretion and may be a system comprised of several different components including, but not limited to trenches and pumps, sheet piling, wells, and well points. While the Contractor will be given discretion in assembling, operating and maintaining the system, performance of the system will be monitored by the Design Professional. The Contractor shall make adjustments to the dewatering system and shoring to ensure that open excavation areas are hydrostatically controlled at all times. The Design Professional will have final determination as to acceptability of the dewatering system performance. The Contractor shall also control surface runoff so as to prevent entry or collection of water in excavations.
  - 3. Locate dewatering facilities where they will not interfere with utilities and construction work to be performed by others including any follow on Contractors. The Contractor shall adapt and modify dewatering facilities as the project excavation or shoring zones change.
  - 4. Conduct groundwater conveyance and discharge treatment in accordance with discharge permit requirements in Section 01 57 13 – Temporary Erosion and Water Management.
  - 5. The Contractor shall review all information pertinent to the Work and carry out all necessary examinations or investigations and shall make independent interpretations of all available information regarding the requirements, limitations, and constraints of the Work and the conditions under which the Work will be performed. The Contractor shall promptly notify the Design Professional of any ambiguity, inconsistency or unforeseen conditions that may be discovered.
  - 6. The Contractor shall monitor groundwater levels in and around the excavations to ensure that the groundwater levels and hydrostatic pressures are reduced, as required prior to excavation, such that groundwater will not prevent proper completion of all work performed under this Contract. All groundwater level data shall be provided to the Design Professional. A minimum of two groundwater monitoring wells shall be established for each work location (one internal to the shoring system, and one external to the shoring system) such that daily groundwater levels may be monitored.

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7. The Contractor shall provide check valves, flow meters, piping, monitoring, and testing equipment for each well. A flow meter shall be required at each well or well point discharge and shall be installed per manufacturer's recommendations. The Contractor's Dewatering Plan shall be modified as necessary to add wells, decommission/demolish wells, add monitoring locations, add or remove pumps, or change dewatering systems, and make field adjustments to accomplish dewatering to the depths indicated in the Drawings, Specifications, and geotechnical recommendations.
  8. Acceptance by the Design Professional shall not in any way relieve the Contractor from the responsibility for errors therein or from the responsibility for complete and adequate design, materials, installation methods, operation methods, or adequate maintenance of the system.
  9. The Contractor shall employ materials, equipment, and construction methods commonly used and proven as suitable for the duration of construction dewatering and any surface water control systems.
  10. The Contractor shall bear full responsibility for acquiring a water supply and electrical service with which to install and operate any dewatering system components proposed in the Dewatering Plan.
  11. The Contractor shall verify and independently interpret the available subsurface information presented in the reference documents and associated appendices and supplement the existing data as necessary in order to complete the design and construction.

### **1.03 QUALITY ASSURANCE**

- A. The Dewatering Plan shall be designed by a professional civil engineer or licensed hydrogeologist, registered in the State of Washington and specialized in hydrogeology or geotechnical engineering, with at least 5 years of experience in the design, operation and maintenance of similar dewatering systems to design and direct operation of dewatering systems.
- B. Provide water quality, monitor, maintain and submit records/reports as required by the applicable permits.
- C. The dewatering system shall be installed and operated by a contractor or subcontractor with at least 5 years of experience in the installation, operation and maintenance of similar dewatering systems. The Contractor shall use a Washington State Licensed well driller for installation and abandonment of all dewatering wells and monitoring wells.
- D. All electrical work pertaining to the installation of the dewatering system shall be completed by licensed electricians.

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**1.04 SUBMITTALS**

- A. Contractor shall submit all drawings and data in accordance with Section 01 33 00 – Submittals.
- B. The Contractor shall submit and update a Dewatering Plan and include details of the design of dewatering systems, including narrative, drawings and design data, schedule, and phasing of the Work, including the following:
  - 1. The proposed type of dewatering system for each type and location of dewatering.
  - 2. Arrangement, location, and depths of system components. Show the coordinates and locations of monitoring wells on the Drawings as described in paragraph C below.
  - 3. Complete description of equipment and instrumentation to be used, with installation, operation, and maintenance procedures. Include technical data on each pump and monitoring elements of the system. Include a discussion of the operation and fueling requirements, if the system is not electric driven. Include records for scheduled or regular checks of the operation of the system.
  - 4. Types and sizes of treatment systems or filters, if applicable.
  - 5. Design calculations demonstrating adequacy of the proposed systems and equipment.
  - 6. Methods, locations, and treatment for disposal of pumped water.
  - 7. Removal and decommissioning procedures.
  - 8. Submit qualifications of dewatering system designer and installer/operator.
  - 9. Schedule for installation, development, dewatering, detention, and testing which is coordinated with shoring, temporary erosion and sediment control (TESC) and other work. The schedule shall be coordinated with project phasing, monitoring, reporting, and other work tasks such that dewatering does not delay other work or delivery schedules.
  - 10. Dewatering settlement monitoring plans for each Work Area.
  - 11. The Dewatering Plan shall provide dewatering rates and other information specific to each Work Area in a separable form (by system).
- C. The Dewatering Plan and system design shall be stamped by a qualified licensed hydrogeologist or engineer in the State of Washington as described in paragraph 1.03.A. The Dewatering Plan shall include full-size drawing sheets (22"x34" in PDF format) . Submittal shall include all calculations and narrative for Design Professional review and potential Owner's Representative review and approval.
- D. Submit dewatering flow rates, groundwater elevations, and settlement monitoring records.

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**PART 2 – PRODUCTS**

**2.01 MATERIALS**

- A. Furnish all materials, tools, equipment, facilities, and services as required for providing the necessary dewatering work and facilities. Make available equipment, machinery and piping, including standby power and pumps in good working order and of adequate capacity to continue dewatering operations due to equipment failure.
- B. The Contractor shall provide a treatment system and discharge pipes, hoses, tanks, valves and meters, which are capable of treating dewatered groundwater to the required applicable permit discharge thresholds at all times during dewatering, see Section 01 57 13 – Temporary Erosion and Water Management.
- C. Contractor shall provide all equipment for dewatering systems, including but not limited to pumps, pipes, check valves, flow meters, regulators and groundwater monitoring equipment.
- D. Well construction shall conform to Ecology requirements for monitoring, reporting, and decommissioning groundwater monitoring wells. Refer to Section 33 24 13 – Monitoring Wells.

**PART 3 – EXECUTION**

**3.01 CONSTRUCTION**

- A. Dewatering System
  - 1. Contractor shall develop a Dewatering Plan sufficient to dewater the Work Area to accomplish the Work indicated in the Drawings and Specifications. The Contractor shall revise the Dewatering Plan as necessary to address field site specific conditions. Contractor shall provide all tanks, meters, and necessary appurtenances to provide daily logs for dewatering and discharge to the Design Professional. Flow metering is required for all dewatered water.
  - 2. Perform dewatering in accordance with drawings and design data. Keep the Design Professional advised of changes made to accommodate field conditions and on completion of the dewatering system installation, revise and resubmit drawings as necessary to indicate the installed configuration.
  - 3. Contractor shall provide all wells, pumps, hoses, valves, meters, water level monitoring devices, tanks, trucks, equipment, labor, tools, transmission systems, and materials to dewater and discharge dewatered water for the construction of the project. Discharge of pumped water from excavation and drainage areas, meeting quantity and quality of discharge permit requirements, as specified in Section 01 57 13 – Temporary Erosion and Water Management.

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4. Organize dewatering operations to maintain the groundwater level within the excavation zone as required and provide a stable, substantially dry subgrade.
  5. If during the construction of the dewatering system the Contractor suspects that site conditions vary from those used to establish the Dewatering Plan, the Contractor shall immediately inform the Engineer of record for the Dewatering Plan and the Design Professional. Upon review of the suspected differing site conditions by the Engineer of record, the Contractor shall revise the Dewatering Plan as necessary to achieve the requirements of the Specifications herein and the Drawings.

### **3.02 DEWATERING**

- A. Contractor shall pump and treat dewatered water for discharge. Hoses, pipes, and appurtenances shall not obstruct Work Areas or terminal activities.
- B. The Contractor shall develop a Dewatering Plan which allows the work to be phased as needed during construction.

### **3.03 FIELD QUALITY CONTROL**

- A. Contractor shall maintain and keep records.
- B. Contractor shall observe and record the average flow rate and time of operation of each pump used in the dewatering systems. Provide appropriate devices, such as flow meters, for observing the flow rates. Contractor shall submit daily flow-rate and groundwater level data to the Design Professional during the period that the dewatering systems are in operation.
- C. Contractor shall submit observation records to the Design Professional, within 24 hours of reading the flow-rate and groundwater level data.
- D. Contractor shall submit discharge monitoring reports to Ecology as required by the CSGP and the associated Administrative Order.

### **3.04 SETTLEMENT MONITORING**

- A. Contractor shall establish survey monitoring control points to monitor for dewatering settlement and shoring installation induced settlement at each work location. Survey monitoring shall be performed by a licensed surveyor, registered in the State of Washington.
- B. Contractor shall establish survey monitoring control points and take base line measurements, prior to conducting any subsurface work including shoring installation.
- C. Monitoring control points shall include all fixed structures within or adjacent to the Work Areas or as directed by the Design Professional, each area of dewatering will require a minimum of three (3) monitoring points. Locations of monitoring points will be determined by the Design Professional.

- D. Settlement monitoring data shall be collected three times per week and shall be coordinated with the Shoring Plan described in Section 31 50 00 – Shoring and Trench Safety Systems. Submit baseline monitoring reports prior to construction and following monitoring points within 24 hours of measurements.
- E. Settlement Limits
  - 1. Maximum combined vertical ground settlement shall not exceed 0.08 feet.
  - 2. Maximum combined vertical settlement of building elements shall not exceed .01 feet.
- F. In the event that settlements exceed the tolerable limits the Contractor shall halt dewatering activities until the item out of tolerance can be brought back within tolerance. All costs associated with returning the item within tolerance shall be at no additional cost to the Owner.

**END OF SECTION**

**SECTION 31 51 00**  
**SHORING AND TRENCH SAFETY SYSTEMS**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. This section specifies requirements for the Contractor designed temporary shoring and trench safety systems to be used in the upland excavation areas.

**1.02 REFERENCES**

- A. R.C.W. Chapter 49.17 WISHA.
- B. WAC 296-155 Safety Standards for Construction Work.
- C. WAC 296-155-660.
- D. R.C.W. Chapter 39.04.180 Public Works/Trench Excavations - Safety Systems Required.
- E. Relevant information provided in the Appendix to these Specifications includes the following:
  - 1. Geotechnical Investigation provided as an Appendix to these Specifications.

**1.03 SUBMITTALS**

- A. Submit a Shoring Plan (see requirements in Article 3.02.D).
  - 1. The Shoring Plan shall include structural shoring or shoring systems and calculations showing all anticipated design loads (including surcharge from equipment loads) sealed by a licensed structural engineer in the State of Washington and shall be submitted for review. The Contractor shall review the geotechnical reports mentioned in Article 1.02 above for shoring, and soils criteria.
- B. The Contractor shall also submit proposed Crane Pad Protection Plans and anticipated loads associated with crane lifts required to install applicable scopes of work as part of the shoring plan for concurrent review and approval.

**PART 2 – PRODUCTS**

Not Used.

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**PART 3 – EXECUTION**

**3.01 EXCAVATION SAFETY SYSTEMS**

- A. Excavation to construct catch basins, vaults, pipes, and conduits may require different shoring conditions and methods. The Contractor shall provide shoring capable of being installed to conduct work as indicated in the Drawings and protect existing utilities, adjacent pavements, Boiler Building, and features to remain.
- B. Protect all utility trench excavations in excess of four (4) feet in depth with a safety system conforming to the referenced requirements. A trench box may be slid under existing utilities and the upper four (4) feet shall be sloped back at a maximum slope of 1.5H:1V. Existing utilities to be protected in place shall be temporarily supported for the width of the excavation zone.
- C. The Contractor's trench safety system shall be designed by a qualified person and meet the referenced requirements.
- D. All excavation not included in trench safety systems shall also meet the WISHA safety standards and the requirements of Section 31 00 00 - Earthwork.

**3.02 TEMPORARY SHORING**

- A. The Contractor shall provide all materials, labor, and equipment necessary to shore work area to protect the work, existing property, utilities, pavement, other existing conditions, and to provide safe working conditions in the work area
- B. The Contractor may elect to use any combination of shoring and overbreak, sliding trench shield, or other method of accomplishing the work consistent with local, State, or Federal safety codes.
- C. All pits greater than four (4) feet deep shall be shored. The Contractor alone shall be responsible for the design of the shoring systems and worker safety, and the Owner assumes no responsibility.
- D. The Contractor shall be responsible for restoring, repairing, and replacing any existing condition beyond the neat lines shown in the drawings for demolition, damage, and/or construction activities associated with the proposed shoring system or damage caused by equipment beyond those limits shown in the Drawings.
- E. Upon completion of the work, the Contractor shall remove all shoring unless the Drawings or the Design Professional direct otherwise.
- F. Utility trench shoring to be removed, or movable trench shields or boxes, shall be located at least 2.5 pipe diameters away from metal or thermoplastic pipe if the bottom of the shoring, shield, or box extends below the top of the pipe, unless a satisfactory means of reconsolidating the bedding or side support material disturbed by shoring removal can be demonstrated.



**LUTHER BURBANK PARK WATERFRONT IMPROVEMENTS**  
**SECTION 31 51 00**  
**SHORING AND TRENCH SAFETY SYSTEMS**

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- G. Damages resulting from improper shoring or failure to shore shall be the sole responsibility of the Contractor
  - H. Backfilling shall be coordinated with temporary shoring removal to prevent voids, sloughing, or other disturbed soil zones. The resulting void or disturbed soil zone from behind the shoring to the face of the vault shall be backfilled up to subgrade elevation. The Contractor shall submit to the Design Professional a shoring and backfilling plan for approval.

**END OF SECTION**

**SECTION 31 62 17**  
**DRIVEN STEEL PILES**

**PART 1 – GENERAL**

**1.01 RELATED DOCUMENTS AND WORK SPECIFIED ELSEWHERE**

- A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this section.
- B. References and standards listed herein are to be the latest edition available, unless specifically stated otherwise.
- C. Work related to this section is described in the following sections:
  - 1. Section 05 12 00 – Structural Steel Framing
  - 2. Section 05 50 00 – Metal Fabrications
- D. Permits related to in-water work

**1.02 SUMMARY**

- A. This section includes steel pipe piles and steel pin piles.

**1.03 PREINSTALLATION CONFERENCE**

- A. Conduct conference at Project site.
- B. Coordinate attendance of representatives of each entity directly concerned with driven steel piles, including the following:
  - 1. General Contractor's Superintendent.
  - 2. Piling Subcontractor.
  - 3. Owner or Owner's Representative
  - 4. Architect.
  - 5. Structural Engineer.
  - 6. Geotechnical Special Inspector.
  - 7. Building Official, when required.
- C. Review the following:
  - 1. Special inspection and testing procedures.
  - 2. Protocol for field corrections and nonconformance issues.
  - 3. Expected soil conditions to be encountered during pile installation.
  - 4. Allowable tolerances for pile installation.
  - 5. Required minimum hammer energy and blows per foot (refusal criteria).

6. Requirements for high strain dynamic monitoring.

#### **1.04 SUBMITTALS**

- A. Product Data: For each type of pile product, accessory, and paint or coating indicated.
- B. Shop Drawings: Show fabrication and installation details for piles, including splices and tip details.
  - 1. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld.
  - 2. Indicate locations, sizes, type, and arrangement of reinforcement.
  - 3. Include arrangement of static pile reaction frame, test and anchor piles, equipment, and instrumentation. Submit structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Welding certificates.
- D. Qualification Data: For Installer.
- E. Material Certificates: For steel pipe piles and accessories signed by manufacturers.
- F. Pile Driving Equipment: Vibratory Pile Driving Equipment and Impact Pile Driving Equipment required to reach minimum pile tip elevations shown in drawings. Include type, make, maximum rated energy, and rated energy per blow of hammer; weight of striking part of hammer; weight of drive cap; details, type, and structural properties of hammer cushion; and details of follower and jetting equipment.
- G. Static Pile Test Reports: Submit within 2 days of completing each test.
- H. Pile Driving Records: Submit within 2 days of driving each pile, including surveyed horizontal pile locations relative to location specified in drawings, installed tip elevation, and cutoff elevation. Construction of the steel pier framing, float, and debris boom shall not proceed until the Design Professional has reviewed Pile Driving Records.
- I. Minutes of preinstallation conference.

#### **1.05 QUALITY ASSURANCE**

- A. Installer Qualifications: A firm experienced in installing driven piles similar in material, design, and extent indicated for this project, whose work has resulted in construction with a record of successful in-service performance.
  - 1. The installer's responsibility includes providing a Qualified Professional Engineer to prepare pile driving records.
  - 2. The installer shall have successfully completed at least three contracts in the last seven years that included installing piles for supporting marine structures.
  - 3. Skilled work personnel shall be experienced and familiar with the installation of piles for supporting marine structures. Supervisory personnel shall have successfully

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completed three projects wherein their work included installing piles for supporting marine structures.

- B. Testing Agency Qualifications: An Independent Testing Agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.
- C. Comply with requirements of the following publications:
  - 1. AISC's "Load and Resistance Factor Design Specification for Structural Steel Buildings."
- D. Welding Standards: Qualify welding procedures and personnel according to AWS D1.1, "Structural Welding Code-Steel.
- E. Preinstallation Conference: Conduct conference to comply with requirements in 01 30 00 Administrative Requirements – 1.06 Preinstallation Conferences.
- F. Wave Equation Analysis: A wave equation analysis shall be performed at the expense of the Contractor by a Registered Professional Engineer. The wave equation analysis shall account for the pile type, size, and length; soil profile and characteristics hammer and cushion characteristics; and ultimate pile internal stresses. The wave equation analysis shall establish maximum hammer energy settings and maximum blow counts per foot required to keep pile stresses under  $0.90 \cdot F_y$ . The wave equation analysis shall also establish minimum hammer energy settings and minimum blow counts per foot required to achieve the pile ultimate compression capacities shown in the contract drawings.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver piles to project site in such quantities and at such times to ensure the continuity of installation. Handle and store piles at project site to prevent physical damage.
  - 1. Protect pile coatings and touch up damage to coatings before driving piles.

#### **1.07 PROJECT CONDITIONS**

- A. Protect structures, underground utilities, and other construction from damage caused by pile driving.
- B. Site Information: A geotechnical report has been prepared for this project and is included elsewhere in the Project Manual for information only.

### **PART 2 – PRODUCTS**

#### **2.01 STEEL PIPE PILES**

- A. Steel Pipe: ASTM A 252, Grade 3, modified ( $F_y = 50\text{ksi}$ ); seamless or welded.

## **2.02 PILE ACCESSORIES**

- A. Conical pile caps
  - 1. Color – White
  - 2. UV-Resistant Polyethylene
  - 3. Mold and mildew resistant

## **2.03 FABRICATION**

- A. Pile Lengths: After reviewing static pile test reports, the Design Professional will verify pile lengths.
- B. Fabricate and assemble piles in shop to greatest extent possible.
- C. Fabricate full length piles without splicing. The pile lengths shall be determined from the pile cutoff elevations and tip elevations shown on plan, plus an additional 3 feet.
- D. Fit and weld driving points to tip of pile according to manufacturer's written instructions and AWS D1.1 for procedures, appearance and quality of welds, and methods used in correcting welding work.
- E. Pile Length Markings: Permanently mark each pile with horizontal lines at 12-inch intervals; mark the distance from pile tip at 60-inch intervals.
- F. Galvanizing: Galvanize piles from top (cut-off elevation) to a minimum of 5 feet below finished grade or mudline. Galvanizing shall conform to the requirements of ASTM A123.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION**

- A. Site Conditions: Do not start pile driving operations until earthwork fills have been completed or excavations have reached an elevation of 6 to 12 inches above bottom of footing or pile cap.

### **3.02 DRIVING EQUIPMENT**

- A. The type and size of the driving hammer shall be chosen by the contractor to achieve the minimum tip elevations and required pile capacities shown in the plans. The contractor shall assume that an impact hammer shall be required to achieve pile penetration into the dense bearing alluvial soils present at the site.
- B. Vibratory Pile Hammer: Air-, steam-, or diesel-powered type capable of consistently delivering driving energy to pile within range recommended by hammer manufacturer for length and weight of pile and character of subsurface material anticipated.

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- C. Impact Pile Hammer (as required for difficult driving conditions): Air-, steam-, or diesel-powered type capable of developing ultimate pile capacity indicated considering length and weight of pile and character of subsurface material anticipated.
  - D. Hammer Cushions and Driving Caps: Between hammer and top of pile, provide hammer cushion and steel driving cap recommended by hammer manufacturer for type of pile.
  - E. Leads: Use fixed or rigid-type pile driver leads that will hold full length of pile firmly in position and in axial alignment with hammer. Extend leads to within 24 inches of elevation at which pile enters ground.

### **3.03 DRIVING PILES**

- A. General: Continuously drive piles to elevations and penetration resistance indicated on the plans. Establish and maintain axial alignment of leads and piles before and during driving. Do not exceed the maximum allowable energy settings and blow counts established by the wave equation analysis.
- B. Heaved Piles: Redrive heaved piles to tip elevation at least as deep as original tip elevation with a driving resistance at least as great as original driving resistance.
- C. Driving Tolerances: Drive piles without exceeding the following tolerances, measured at pile heads:
  - 1. Location: 2 inches after pile driving is completed.
  - 2. Plumb: Maintain 1-inch in 10 feet from vertical but shall not exceed a maximum of 1 inch deviation from plumb when installed.
- D. Withdraw damaged or defective piles and piles that exceed driving tolerances and install new piles within driving tolerances. Fill holes left by withdrawn piles that will not be filled by new piles using cohesionless soil material, such as gravel, broken stone, and gravel-sand mixtures. Place and compact in lifts not exceeding 72 inches.
- E. Cutting Off: Cut off tops of driven piles square with pile axis and at elevations indicated. Cut off pile elevations shall not deviate from plans by more than 1/8 inch (+/-).
- F. Pile Driving Records: Maintain accurate driving records for each pile, compiled and attested to by the Owner's Special Inspector. Include the following data:
  - 1. Project name and number.
  - 2. Name of Contractor.
  - 3. Type of pile and date of placement.
  - 4. Pile location in pile relative to specified grid intersection.
  - 5. Sequence of driving in pile group.
  - 6. Pile dimensions.
  - 7. Ground or mudline elevation.
  - 8. Elevation of tips after driving.
  - 9. Final tip and cutoff elevations of piles after driving pile group.

10. Records of redriving.
11. Type, make, model, and rated energy of hammer(s).
12. Weight and stroke of hammer(s).
13. Type of pile driving cap used.
14. Cushion material and thickness.
15. Actual stroke and blow rate of hammer.
16. Pile driving start and finish times, and total driving time.
17. Time, pile tip elevation, and reason for interruptions.
18. Number of blows for each 12 inches of penetration, and number of blows per 1-inch for the last 6 inches of driving.
19. Pile deviations from location and plumb.
20. Preboring, jetting, or special procedures used.
21. Unusual occurrences during pile driving.

#### **3.04 FIELD QUALITY CONTROL**

- A. Testing Agency: Owner will engage a Qualified Independent Testing Agency to perform field quality control testing.
- B. Weld Testing: In addition to visual inspection, welds shall be tested and inspected according to AWS D1.1 and the inspection procedures listed below at Testing Agency's option. Correct deficiencies in work that test reports and inspections indicate does not comply with the contract documents.
  1. Liquid Penetrant Inspection: ASTM E 165.
  2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
  3. Radiographic Inspection: ASTM E 94; minimum quality level "2-2T."
  4. Ultrasonic Inspection: ASTM E 164.

#### **3.05 DISPOSAL**

- A. Remove withdrawn piles and cutoff sections of piles from site and legally dispose of them off Owner's property.

**END OF SECTION**

# **DIVISION 32**

## **EXTERIOR IMPROVEMENTS**



**SECTION 32 11 23**  
**AGGREGATE BASE COURSE**

**PART 1 – GENERAL**

**1.01 SUMMARY OF WORK**

- A. Extent of Work: The work for “Aggregate Base Course” includes preparing underlying course or prepared subgrade composed of crushed coarse aggregate. Base course shall be constructed on a prepared underlaying course in accordance with these specifications and shall conform to the dimensions and typical cross sections as indicated in the Drawings.

**PART 2 – PRODUCTS**

See Section 31 00 00 – Earthwork

**PART 3 – EXECUTION**

**3.01 PLACEMENT OF BASE COURSE AGGREGATES**

- A. Preparation of Subgrade: Immediately prior to placement of surfacing materials, clean the entire width of the area of all debris and dispose of as directed by the Design Professional. All depressions or ruts which contain stormwater shall be drained.
- B. Shape the entire subgrade to a smooth uniform surface, true to line, grade, and cross section as staked by the Design Professional. Compact the material for a depth of six inches below the subgrade to 95 percent of the maximum density as determined by compaction tests ASTM D1557. If soft or spongy material underlying the upper six inches of the area being prepared precludes satisfactory compaction of the upper six inches, loosen, aerate, or excavate, replace and compact to the required density as directed by the Design Professional.
- C. Remove and dispose of excess material which cannot be disposed of by normal drifting to low spots during blading and shaping operations or by placing in subgrade areas deficient in materials or by wasting, all as directed by the Design Professional. Subgrade areas deficient in materials shall be brought to grade by importing suitable materials from other subgrade areas or other sources as directed by the Design Professional. Materials added to subgrade areas deficient in materials shall be watered and compacted as necessary to yield a true finished subgrade as described above.
- D. Once it is prepared, maintain the subgrade for surfacing in the finished condition until the first course of surfacing has been placed.

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**SECTION 32 11 23**  
**AGGREGATE BASE COURSE**

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- E. Subgrade Protection: Take all precautions necessary to protect the subgrade from damage; hauling over the finished subgrade shall be limited to that which is essential for construction purposes. Equipment used for hauling over the prepared subgrade which, in the opinion of the Design Professional, is causing undue damage to the prepared subgrade or to the underlying materials, shall be removed from the Work at the request of the Design Professional. Repair at the Contractor's expense all cuts, ruts and breaks in the surface of the subgrade prior to placing surfacing. Protect the prepared subgrade from both the Contractor's traffic and public traffic and maintain the subgrade by blading and rolling as frequently as may be necessary to preserve the subgrade in a completely satisfactory condition.
- F. No measurement or payment will be made for the Work involved in the protection of subgrade.

**END OF SECTION**

**SECTION 32 12 16**  
**ASPHALT PAVING**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. Extent of Work: The work for “Bituminous Concrete Pavement, Asphalt Concrete Pavement, Asphalt Paving, or Hot Mix Asphalt (HMA) Pavement” as indicated on the Drawings.
  - 1. The Work includes the requirements for producing, transporting, placing, shaping and compacting of one or more courses of materials in conformance with these Specifications and the dimensions and sections indicated on the Drawings or within the lines and grades established by the Design Professional.

**1.02 QUALITY ASSURANCE**

- A. Testing and Inspection for Contractor Quality Control: The Contractor shall perform the inspection and tests described below. Based upon the results of these inspections and tests, the Contractor shall take the action required and shall submit specified reports.
  - 1. Sampling and Testing of Materials
    - a. Base Course Density
    - b. Base Course Smoothness
    - c. Pavement Thickness
    - d. Pavement Smoothness
    - e. Pavement Permeability
    - f. Pavement Density
- B. Materials and work shall be performed in accordance with and shall meet the requirements of the pertinent sections of the Washington State Department of Transportation (WSDOT) Standard Specifications for Road, Bridge and Municipal Construction and Amendments (current edition).
- C. Sampling and testing for compliance with the Contract provisions shall be in accordance with Section 01 40 00 –Quality Requirements. Tests conducted for the sole benefit of the Contractor shall be at the Contractor’s expense.
- D. Unless otherwise referenced or modified, quality control and quality standards for this section shall be as specified in the Washington State Department of Transportation (WSDOT) Standard Specifications for Road, Bridge and Municipal Construction and Amendments (current edition).

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**1.03 DEFINITIONS**

- A. Combined Aggregate: Mineral constituents of asphalt concrete mix, including mineral filler and separately sized aggregates.

**1.04 REFERENCES**

- A. Washington State Department of Transportation (WSDOT) Standard Specifications for Road, Bridge and Municipal Construction and Amendments (current edition).

**1.05 JOB CONDITIONS**

- A. Existing Utilities:
  - 1. Underground utilities are indicated in the Drawings. The Contractor shall pave around and match the finished grade elevation, flush with existing utility access covers or adjust lids to grade as indicated on the Drawings. Utilities may be missing from plan drawings, contractor has responsibility to determine exact utility locations prior to excavation.
- B. Special Controls: The Contractor shall control dust at all times, while planing (cold milling) the existing asphalt concrete pavement and saw cutting Portland Cement Concrete pavement. The Contractor shall provide all water, tanks, trucks, hoses, labor and materials for on-site construction activities and implement additional measures at the request of the Design Professional.

**1.06 SUBMITTALS**

- A. The Contractor shall provide to the Design Professional the Manufacturer's Certificate of Compliance for the following materials:
  - 1. Aggregate: Gradation, source test results as defined in Section 9-03.8 of WSDOT Standard Specifications.
  - 2. Asphalt for Binder: Type, grade, and viscosity-temperature curve.
  - 3. Tack Coat and Inter-Layer Seal Coat: Type and grade of coat.
  - 4. Asphalt Concrete Mix Design (for each design mix used).
- B. Submit a minimum of 15 days prior to start of production
- C. Submittal to include the following:
  - 1. Gradation and portion for each aggregate constituent used in mixture to produce a single gyration of aggregate within specified limits.
  - 2. Bulk specific gravity of each aggregate constituent.
  - 3. Measured maximum specific gravity of mix at optimum asphalt content determined in accordance with ASTM D 2041.

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- 4. Properties as stated in this section for at least 4 different asphalt contents other than optimum, 2 below optimum, and 2 above optimum.
  - 5. Percent of asphalt lost due to absorption by aggregate.
  - 6. Index of retained strength (TSR) at optimum asphalt content as determined by AASHTO T283.
  - 7. Percentage of asphalt cement, to the nearest 0.1 percent, to be added to the mixture.
  - 8. Optimum mixing temperature.
  - 9. Optimum compaction temperature.
  - 10. Temperature-viscosity curve of asphalt cement to be used.
  - 11. Brand name of any additive to be used and percentage added to mixture.
  - 12. Air Voids
- D. Crack seal and Slurry Seal Materials:
- 1. Aggregate source and gradation
  - 2. Manufacturer's application recommendations
- E. Statement of Qualifications for independent testing laboratory
- F. Test Results:
- 1. Mix Design
  - 2. Asphalt concrete core densities
  - 3. Gradation and asphalt content of non-compacted mix
  - 4. Field Density
  - 5. Pavement section permeability (including inter-layer seal)
  - 6. Quality Control
- G. Contractor shall provide to the Design Professional, compliance and test data for each paving location, unless otherwise directed by the Design Professional.
- H. Density testing shall be performed in the field for each day of paving and for each lift of pavement placed. At a minimum, one (1) density tests shall be performed at each paving location for each lift of pavement.
- I. Truck tickets and scale certifications shall be submitted for all imported and exported items.

## **PART 2 – PRODUCTS**

### **2.01 PAVEMENT CLASS**

- A. Asphalt pavement shall meet all applicable WSDOT requirements for HMA Class ½ inch, bituminous pavements as indicated on the Drawings. HMA shall conform to a class greater than or equal to 30M ESAL's, in accordance with WSDOT specification Section 9-03.8(2).

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Commercial HMA Evaluation, in accordance with section WSDOT specification 5-04.3(7)A, will be used for acceptance.

- B. The Contractor may choose to utilize recycled asphalt pavement (RAP) in the production of HMA. If utilized, the amount of RAP shall not exceed 20 percent of the total weight of the HMA. The RAP may be from pavements removed under the Contract or pavement material from an existing stockpile.

## **2.02 AGGREGATES**

- A. Aggregates for bituminous concrete shall be manufactured from ledge rock, talus, or gravel and shall meet the requirements of the WSDOT Standard Specifications.
- B. Tests: Tests, testing methods and results shall be as specified in the WSDOT Standard Specifications.
- C. Grading: Shall be as required by the WSDOT Standard Specifications for Class B asphalt concrete and such other classes called for on the Drawings. Coarse and fine aggregates shall be proportioned in the approximate ratio of 35% Coarse to 65% Fine aggregates.
- D. The Contractor may furnish aggregates from multiple stockpiles. The gradation of the aggregates when combined shall be in compliance, such that the completed mixture complies with all aspects of the mix proportions and sieve requirements.
- E. Fracture requirements for the combined coarse aggregate shall apply to the material when retained on the U.S. No. 4 sieve and above and have a minimum of 2 fractured faces and 90 percent fracture, when tested in accordance with AASHTO T 335.
- F. The uncompacted void content for the combined fine aggregate shall be tested according to AASHTO T 304 Method A with a minimum of 40 percent voids for commercial evaluation.
- G. Blending sand in an amount specified by the Design Professional may be used to make up a deficiency of material passing a U.S. No. 40 sieve, provided that the aggregate in the final mix meets pertinent fracture requirements. Blending sand shall be clean, hard, sound material, either naturally occurring sand or crusher fines and must be material which will readily accept an asphalt coating. The minimum sand equivalent for the aggregate shall be 45 (see Section 9-03.8(2) of the WSDOT Standard Specifications). Mineral Filler shall meet the requirements of the WSDOT Standard Specifications. Recycled waste foundry sand shall not be used.
- H. HMA proportions of materials shall be of the sizes, grading and quantity that when proportioned and mixed together they will produce a well graded mixture with the following requirements:

**LUTHER BURBANK PARK WATERFRONT IMPROVEMENTS  
SECTION 32 12 16  
ASPHALT PAVING**

	<b>HMA CLASS</b>	
<b>Per WSDOT Section 9-03.8(2)</b>	<b>1/2 inch</b>	
<b>HMA Mix Criteria</b>	<b>Min.</b>	<b>Max.</b>
Voids in Mineral Aggregate (VMA),%	14.0	-
Voids Filled with Asphalt (VFA), % ≥30 million ESAL's	65	75
Dust/Asphalt Ratio	0.6	1.6
Modified Lottman Stripping Test (AASHTO T-283)	Pass	-

	<b>ESAL's (millions)</b>	<b>N<sub>initial</sub></b>	<b>N<sub>design</sub></b>	<b>N<sub>max.</sub></b>
% Gmm	≥ 3	≤ 89.0	96.0	≤ 98.0
Gyratory Compaction (number of gyrations)	≥ 30	9	125	205

<b>HMA AGGREGATE GRADATION Per WSDOT Section 9-03.8(6)</b>	
<b>Sieve Size</b>	<b>Percent Passing</b>
	<b>HMA Class 1/2 inch</b>
1-1/2" Square	-
1" Square	-
3/4" Square	99-100
1/2" Square	90-100
3/8" Square	90 Max.
U.S. No. 4	-
U.S. No. 8	28-58
U.S. No. 200	2-7

## **2.03 BITUMINOUS MATERIALS**

- A. Bituminous Materials shall meet the requirements of the WSDOT Standard Specifications (current edition) for the following:
1. Tack Coat shall meet all the requirements of Section 5-04.

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2. Inter-layer Seal shall follow the requirement of Section 5-02. Unless otherwise approved by the Design Professional, the inter-layer seal shall be CSS-1, CSS-1h, or STE-1 emulsified asphalt.
  3. Joint Sealer shall be in accordance with Section 9-04.2(1).
  4. Asphalt for concrete shall be PG 58H-22 in accordance with Section 9-02.1(4).

#### **2.04 PROPORTIONS OF MATERIALS**

- A. The materials of which bituminous concrete is composed shall be of such size, grading and quantity that, when proportioned and mixed together, they will produce a well-graded mixture within the requirements listed in the WSDOT Standard Specifications.
- B. The actual proportions of the several components to be used in the production of the asphalt concrete mixture shall be within the WSDOT specified limits to provide a pavement having surface texture, air voids, Voids in Mineral Aggregate (VMA), and Voids Filled with Asphalt (VFA) values satisfactory to the Design Professional. The proportions so fixed shall be changed only by the Design Professional's approval.

#### **2.05 PAVEMENT SAWCUTTING**

- A. Provide all water, cutting blades, electric power supply, fuel, and compressed air, as required for saw cutting equipment.

#### **2.06 CRACK SEALING**

- A. Materials as specified in Section 5-03.3(2) of the WSDOT Standard Specifications (current edition).
- B. Contractor shall provide compressed air as required.

### **PART 3 – EXECUTION**

#### **3.01 ESTABLISHING EXISTING GRADES**

- A. The Contractor shall provide site survey and check grades to establish existing crown, valley and flow line conditions in such a manner as to maintain existing grades and construct new grades as indicated in the grading and paving drawings. The Contractor shall have surveyors verify grades and confirm that new grading will not result in sags and allow surface runoff to pond.

#### **3.02 PLANING ASPHALT CONCRETE**

- A. The Contractor shall maintain existing grades across the site and perpetuate inlet catchment areas.



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- B. Planing bituminous pavement shall be performed in such a manner that the underlying pavement is not torn, broken, or otherwise damaged by the planing operation. Delamination or raveling of the underlying pavement will not be construed as damage due to the Contractor's operations. However, the Contractor shall not run the machine too quickly, as to cause tearing and excessive spalling of the existing pavement. Pavement outside the limits shown in the drawings or as designated by the Engineer that is damaged by the Contractor's operations shall be repaired to the satisfaction of the Engineer, at the Contractor's expense.
  - C. The planing equipment shall have automatic controls, with sensors for both sides of the equipment. The controls shall be capable of sensing the grade from an outside reference line or a mat-referencing device. The automatic controls shall have a transverse slope controller capable of maintaining the mandrel at the desired transverse slope within  $\pm 0.1$  percent.
  - D. Small planing equipment (manual or automatic) shall be used around manholes, catch basins, vaults, handholds, and/or other underground structures and for transitions.
  - E. Material developed from the planing machine shall be directly transferred to a truck and hauled off-site. Pavement millings shall not be wind-rowed, stockpiled or stored on-site.

### **3.03 CRACK SEALING**

- A. All cracks and joints, underneath the planed pavement areas, which are  $\frac{1}{4}$  inch and greater in width shall be cleaned with a stiff-bristled broom along with compressed air and then shall be filled completely with sand slurry.

### **3.04 TACK COAT**

- A. Apply tack coat over existing asphalt, milled asphalt, cement concrete paving and on exposed faces of pavement. The application rate for Tack Coat shall not exceed 0.15 gallons per square yard. In areas receiving paving fabric, the tack coat application shall be 0.20 to 0.25 gallons per square yard of residual asphalt or as recommended by the manufacturer. Areas to receive Tack Coat must be approved by the Design Professional prior to application.
- B. A tack coat of asphalt shall be applied to all paved surfaces on which any course of HMA is to be placed or abutted. Tack coat shall be uniformly applied to cover the existing pavement with a thin film of residual asphalt, free of streaks and bare spots. A heavy application of tack coat shall be applied at all joints. Tack coat shall be limited to surfaces that will be paved during the same work shift. The spreading equipment shall be equipped with a thermometer to indicate the temperature of the tack coat material.

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- C. Equipment shall not operate on tack coated surfaces until the tack has cured. If the Contractor's operation damages the tack coat, it shall be repaired prior to placement of the HMA at no additional cost to the City.

### **3.05 JOINT SEALER**

- A. Apply joint sealer to the edges of new paving joints, existing joints, cracks in the existing asphalt concrete pavement and around catch basins, manholes and utility lids. The Contractor shall apply joint sealer to all cracks and joints less than ¼ inch for all existing pavement surfaces to remain in place within the Work Area as indicated in the Drawings. For requirements of joint sealer, see paragraph 2.03 of this section for Bituminous Material.

### **3.06 ASPHALT CONCRETE**

- A. Mix, handle, batch, haul, place, roll and compact asphalt concrete in accordance with the applicable sections of the WSDOT Standard Specifications (current edition). Place the material to the dimensions and grades indicated on the Drawings or as directed by the Design Professional.

### **3.07 HAULING EQUIPMENT**

- A. Trucks used for hauling HMA pavement shall have tight, clean, smooth metal beds and shall have a cover of canvas or other suitable material of sufficient size to protect the HMA from adverse weather. Whenever the weather conditions during the work shift include or are forecast to include precipitation or an air temperature less than 45°F, the truck cover shall be securely attached to protect the HMA.
- B. Truck beds are to be sprayed with an environmentally benign release agent, to prevent HMA from adhering to the truck beds. Excess release agent shall be drained prior to filling hauling equipment with HMA. Petroleum derivatives or other coating material that contaminate or alter the characteristics of the HMA shall not be used.

### **3.08 HOT MIX ASPHALT PAVERS**

- A. Hot mix asphalt pavers shall be self-contained, power propelled units, provided with an internally heated vibratory screed and shall be capable of spreading and finishing courses of HMA plant mix material in widths that allow the Contractor to maintain existing crowns and valleys.

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**3.09 ROLLERS**

- A. Rollers shall be steel wheel, vibratory or pneumatic type, in good condition and capable of reversing without backlash. Operation of the roller shall be in accordance with the Manufacturer's recommendations. When requested by the Design Professional, the Contractor shall provide the Manufacturer's recommendations for compaction of HMA. The number and weight of the rollers shall be sufficient to compact the mixture without crushing the aggregate, creating a washboard surface, stripping, pushing or rutting the surface.

**3.10 SPREADING AND FINISHING**

- A. The mixture shall be laid upon an approved surface, spread and struck off to the established grade and elevation. Unless otherwise directed by the Design Professional, the nominal compacted depth of any layer of any course shall not exceed the depth indicated in the Drawings.
- B. On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the paving may be done with other equipment or by hand.

**3.11 COMPACTION**

- A. Immediately after the HMA has been spread and struck off, and after surface irregularities have been adjusted, the mix shall be thoroughly and uniformly compacted. Material shall be compacted to 92 percent minimum or higher to meet minimum permeability requirements. The completed course shall be free from ridges, ruts, humps, depressions, objectionable marks, checking, tearing, cracking, and irregularities and shall conform to line, grade and sections shown in the Drawings. If necessary, the job mix formula may be altered to achieve desired results.
- B. Compaction shall take place when the mixture is in the proper condition so that no undue displacement, cracking or shoving occurs. Areas inaccessible to large compaction equipment shall be compacted by mechanical or hand tampers. Any HMA that becomes loose, broken, contaminated, shows an excess or deficiency of asphalt or is in any way defective, shall be removed and replaced with new hot mix that shall be immediately compacted to conform to the surrounding area.
- C. The type of rollers to be used and their relative position in the compaction sequence shall generally be at the Contractor's option, provided the specified densities are attained. An exception shall be that pneumatic tire rollers shall be used for compaction of the wearing course beginning October 1<sup>st</sup> of any year through March 31<sup>st</sup> of the following year. Unless otherwise approved by the Design Professional, rollers shall only be operated in the static mode when the internal temperature of the mix is less than 175°F.

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**3.12 TRANSVERSE JOINTS**

- A. The Contractor shall conduct operations such that placement of the top or wearing course is a continuous operation or as close to continuous as possible. Unscheduled transverse joints will be allowed and the roller may pass over the unprotected end of the freshly laid mixture only when the placement of the course must be discontinued for such a length of time that the mixture will cool below compaction temperature. When the Work is resumed, the previously compacted mixture shall be cut back to produce a slightly beveled edge for the full thickness of the course.
- B. A temporary wedge shall be constructed at a 10H:1V slope at the transverse joint for temporary construction traffic. Top pick or bomb carts shall not be allowed to cross site paving areas. No terminal traffic shall be allowed until the final lift of HMA is complete and flush with existing pavement.
- C. The HMA in the temporary wedge shall be separated from the permanent HMA by strips of heavy wrapping paper. The wrapping paper shall be removed and the joint trimmed to a slightly beveled edge for the full thickness of the course. Material that is cut away shall be wasted. Rollers shall be used to seal the joint.

**3.13 LONGITUDINAL JOINTS**

- A. The longitudinal joint in any one course shall be offset from the course immediately below by no more than 6 inches and no less than 3 inches.

**3.14 SURFACE SMOOTHNESS**

- A. The completed surface shall be of uniform texture, smooth and free of defects. The completed surface of the wearing course shall not exceed 1/8 inch variation between grade breaks on a 10 foot long straight edge. Milling the surface to grade shall not be allowed. Full removal and replacement will be required.

**3.15 WEATHER LIMITATIONS**

- A. Hot mix asphalt pavement shall not be placed while it is raining or directly after a rain storm event.
- B. HMA shall not be placed on any wet surface or when the average surface temperatures are less than listed below:

Surface Temperature Limitation		
Compacted Thickness (ft.)	Wearing Course	Other Courses
0.21 to 0.35	35°F	25°F*

\*Only on dry subgrade, not frozen and when air temperature is rising.

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**3.16 ANTI-STRIPPING ADDITIVE**

- A. Anti-stripping additive shall be added at the Contractors option and according to the Manufacturer's recommendations.

**END OF SECTION**

**SECTION 32 13 13**  
**CONCRETE PAVING AND MISCELLANEOUS CONCRETE**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. The Work described in this section includes, but is not limited to, forming, placing, finishing, and curing cast-in-place concrete for the following:
- B. Concrete paving for pedestrian surfaces including those that occasionally accommodate vehicular use
- C. Miscellaneous site concrete, including curbs
- D. The extent and location of the concrete paving and other miscellaneous concrete work is indicated on the Drawings. The Work includes the requirements for providing all cast-in-place miscellaneous concrete and associated work in conformance with these Technical Specifications and as indicated on the Drawings.

**1.02 RELATED WORK SPECIFIED ELSEWHERE**

- A. The requirements for reinforced concrete retaining walls, structures, and other cast-in-place concrete shall be per Section 03 30 00 – Cast-in-Place Concrete.
- B. The provisions and intent of the Contract, including the Procurement and Contracting Requirements, Standard Provisions, and General Conditions, apply to this Work as if specified in this section. Work related to this section is described in the following sections:
  - 1. Section 03 10 00 – Concrete Forming and Accessories
  - 2. Section 03 20 00 – Concrete Reinforcing
  - 3. Section 03 30 00 – Cast-in-Place Concrete
  - 4. Section 31 00 00 – Earthwork
  - 5. Section 32 11 23 – Aggregate Base Courses
  - 6. Section 32 12 16 – Asphalt Paving
  - 7. Section 32 14 13 – Pre-Cast Concrete Unit Paving

**1.03 REFERENCES**

- A. Washington State Department of Transportation (WSDOT): Standard Specifications for Road, Bridge, and Municipal Construction; and Amendments (current edition)
- B. American Concrete Institute (ACI) 305R-99: Hot Weather Concreting
- C. ACI 306R-88: Cold Weather Concreting
- D. ACI 308R-01: Guide to Curing Concrete
- E. ASTM International (ASTM) C33: *Concrete Aggregates*

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- F. ASTM C94: Ready-Mixed Concrete
  - G. ASTM C150: Portland Cement
  - H. ASTM C260: Air-Entraining Admixtures for Concrete
  - I. ASTM C309: Liquid Membrane-Forming Compounds for Curing Concrete
  - J. ASTM C494: Chemical Admixtures for Concrete
  - K. ASTM C618: Coal Fly Ash and Raw or Calcinated Possolan for Use in Concrete
  - L. ASTM C920: Elastomeric Joint Sealants
  - M. ASTM C1315: Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete
  - N. ASTM D1752: Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction

#### **1.04 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment. Ready-mixed concrete plants shall be approved and certified by the National Ready Mix Concrete Association (NRMCA) or qualified by WSDOT.
- B. Installer Qualifications: A firm with a minimum of 5 years' experience with concrete placing and finishing. The installer shall have a minimum of 5 years' experience in green-sawing concrete joints.
- C. American Concrete Institute (ACI) Publications: Comply with the following unless modified by requirements in the Contract Documents:
  - 1. ACI 301: Specification for Structural Concrete, Sections 1 through 5
  - 2. ACI 117: Specifications for Tolerances for Concrete Construction and Materials
- D. Pre-Installation Conference: Conduct the conference at the Project Site.
- E. Special Inspection: Notify the Owner at least 48 hours before inspection. Inspection will be required immediately prior to any intended pours or placement of concrete.
- F. Concrete Work: Concrete work, where indicated, shall be exposed, as finished. Special care must be taken to provide specified, finished surfaces without gravel pockets and other defacements.

#### **1.05 SUBMITTALS**

- A. Concrete Mix Design: For each concrete mixture, indicate all material contents per cubic yard (cy) of concrete.
- B. Product Data: For each type of product indicated, include the manufacturer's instructions and color additives.
- C. Certificates: Provide certificates of compliance with the specified mix design and certificates for compressive strength, yield, air content, and slump for each proposed

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concrete mix. Provide written evidence that the concrete ready-mix plant is approved and certified by NRMCA and other organizations.

- D. Shop Drawings: Show pour sequences, construction joints, expansion joints, and steel reinforcement.
- E. Concrete Delivery Tickets: For each truck delivered to the Site, submit tickets to the Owner before unloading at the Site in accordance with ASTM C94.
- F. Records: Maintain records of all concrete placements; indicate exact mix proportions; list the time, date, location in the project, weather conditions at the time of placement, and the source of the concrete supply. Make records available to the Owner at any time during construction and submit them at the end of the concrete placement phase of the project for the purposes of preparing record documents.
- G. Mockup: Provide a concrete pavement panel to demonstrate typical joints, surface finish, texture, tolerances, color, and quality of work standards.
- H. Build a minimum 200-square-foot panel slab on grade for review and approval.
- I. Notify the Owner's Representative 7 days in advance of dates and times when mockups will be constructed.
- J. Maintain approved mockups during construction in an undisturbed condition as a standard of judging the completed pavement.
- K. Demolish and remove approved mockups from the Site that do not become part of the completed Work when directed by the Owner's Representative.
- L. Subject to approval from the Owner's Representative, approved mockups may become part of the completed Work if undisturbed at the time of Substantial Completion.
- M. Refer to Section 03 30 00 – Cast-in-Place Concrete for additional requirements.

## **PART 2 – PRODUCTS**

### **2.01 CONCRETE MATERIALS**

- A. Regional Materials: Concrete shall be manufactured within 100 miles of the Project Site from aggregates and cementitious materials that have been extracted, harvested, or recovered or manufactured within 100 miles of the Project Site.
- B. Aggregates Standard: ASTM C33-86
- C. Cement:
  - 1. Provide cements obtained from the same source or of the same brand for concrete in the same element or portion of the Work.
  - 2. Standard Portland Cement: Columbia, Ideal, Kaiser, Lone Star, Ash Grove, or approved equal; standard gray Portland cement, ASTM C150-86; Type I
  - 3. Pozzolanic Materials: Fly ash, ASTM C618 Type F, except that the maximum allowable loss on ignition shall be 0.75%. Use for all concrete.



- D. Admixtures
  - 1. Use only one brand of admixtures.
  - 2. Water-reducing admixture: Master Builders Pozzolith 300-N or approved chemical admixture conforming to requirements of ASTM C494-86, Type A.
  - 3. Retarder-densifying admixture: Master Builders Retarding Pozzolith or approved equal; ASTM C494-86, Type B
- E. Accelerator: chemical admixture designed to accelerate set on concrete but not corrode reinforcing steel; ASTM C494-86, Type C
- F. Air-entraining agent: Conform to requirements of ASTM C260-86.
- G. Other ingredients: Provide other ingredients as indicated or as required by Code or Reference Standards.
- H. Water: ASTM C94/C94M and potable

## **2.02 CONCRETE MIXES**

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
- B. Class 4000 general-purpose concrete mixture for concrete pavements, pedestrian areas, curbs, and other miscellaneous concrete, in accordance with Section 6-02.3 of the Standard Specifications:
- C. Minimum Compressive Strength: 4,000 pounds per square inch at 28 days, unless indicated otherwise on Structural Drawings
- D. Maximum Water-Cementitious Materials Ratio: 0.45
- E. Slump Limit: 4 inches,  $\pm 1$  inch
- F. Air Content: 5%,  $\pm 1.5\%$  by volume
- G. Quality of Concrete: Assumed compressive strengths and locations of the same are noted on the Drawings.
- H. Concrete shall meet the following requirements:
  - 1. Minimum cementitious material: for cement with fly ash, 6 sacks and 100 pounds of fly ash per cy
- I. Admixtures:
  - 1. Add in accordance with the manufacturer's directions.
  - 2. If approved, water-reducing retardant may be used when the temperature of the concrete, as placed, exceeds 65°F.
  - 3. If approved, an accelerator may be used when the temperature of concrete is less than 40°F.
  - 4. No calcium chloride or other water-soluble chloride-ion admixtures will be permitted unless otherwise approved by the Owner.

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- J. Use retarder/densifier when placing other concrete in warm weather conditions or when the ambient temperature exceeds 65°F.
  - K. Use air-entraining agents in concrete subjected to freezing temperatures after curing. Total air content shall be in accordance with Table 26-B of the International Building Code.

## **2.03 CEMENTITIOUS MATERIALS**

- A. Provide cementitious materials that conform to the appropriate specifications as follows:
  - 1. Portland cement
  - 2. ASTM C150/C150M, Type I or Type II, in accordance with Section 9-03.1 of the Standard Specifications
- B. Fly Ash (pozzolan)
  - 1. Provide fly ash that conforms to ASTM C618, Class-C or F, including requirements of Tables 1A and 2A, in accordance with Section 9-23.9 of the Standard Specifications

## **2.04 AGGREGATES**

- A. Normal-weight aggregates: ASTM C33, graded, 38 or 25 millimeter [mm], 3/4-inch (19 nominal maximum coarse-aggregate size)
- B. Fine aggregates:
  - 1. Fine aggregates shall be free of materials with deleterious reactivity to alkali in cement.
  - 2. Fine aggregates shall consist of sand or other inert materials or a combination thereof having hard, strong, and durable particles free from an adherent coating.
  - 3. Fine aggregate shall be washed thoroughly to remove clay, loam, alkali, organic matter, or other deleterious matter.
  - 4. Fine aggregate shall meet the particle gradation requirements of the Standard Specifications, Section 9-03.1(2)B, for Class 1 fine aggregate.
- C. Coarse aggregates
  - 1. Coarse aggregates shall consist of gravel or other inert materials or a combination thereof having hard, strong, and durable pieces free from adherent coatings.
  - 2. Coarse aggregate shall be washed to thoroughly remove clay, silt, bark, sticks, alkali, organic matter, or other deleterious material.
  - 3. Coarse aggregate shall meet the particle gradation requirements of the Standard Specifications, Section 9-03.1(4)C, for American Association of State Highway and Transportation Officials Grading No. 57.

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**2.05 BONDING AGENTS AND ADHESIVES**

- A. Bonding agents as required
- B. Primers and sealers as recommended by the adhesive and bonding agent manufacturers

**2.06 EXPANSION/ISOLATION JOINTS IN SLABS**

- A. Joint filler: Preformed, non-extruding asphalt impregnated resilient material; ASTM D1752, Type I, 3/8-inch wide by depth required to bring top surface within ½ inch of slab surface to allow for joint sealing
- B. Joint sealer: Self-leveling polyurethane; ASTM C920, Type M, Grade SL, Class 25; gray color
- C. Expansion/isolation joint cap: Removable high-impact extruded polystyrene; place on joint filler during concrete placement and remove cap when ready to seal joint. Joint cap by W.R. Meadows, Inc., or equal.

**2.07 MIXING CONCRETE**

- A. Ready-mixed concrete: Measure, batch, mix, and deliver concrete according to ASTM C94 and ASTM C1116, and furnish batch ticket information.
- B. When the air temperature is between 85°F and 90°F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when the air temperature is greater than 90°F, reduce mixing and delivery time to 60 minutes.

**2.08 CURING MATERIALS**

- A. Clear, solvent based, membrane-forming curing and sealing compound: ASTM C1315, Type 1, Class A. Nonyellowing; volatile organic compound compliant; semigloss sheen.
- B. Provide as method of curing and sealing for exposed-to-view & weather exposed-
- C. Sheen: Medium (semigloss)
- D. Acceptable products
  - 1. A Euclid Chemical Company-Diamond Clear
  - 2. B. Euclid Chemical Company-Diamond Clear 350
  - 3. C. Euclid Chemical Company-Super Diamond Clear
  - 4. D. Euclid Chemical Company-Super Diamond Clear 350
- E. L&M Construction Chemicals, Inc.: Lumiseal WB Plus
- F. W. R. Meadows, Inc.: Vocomp-30
- G. Tamms Industries, Inc.: LusterSeal WB 300
- H. US Mix Products Company: US Spec Radiance UV-25
- I. Vexcon Chemicals, Inc.: Vexcon Starseal 1315 Beading Flat

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- J. Curing compounds for colored concrete: Curing compound shall comply with ASTM C309 and be approved by a color-additive manufacturer for use with colored concrete. Provide color cure and seal products to match colored concrete.

## **2.09 CONCRETE REINFORCEMENT AND DOWELS**

- A. Concrete reinforcement and dowels used for concrete paving and miscellaneous site concrete shall meet the requirements of Section 03 20 00 – Concrete Reinforcing.

## **2.10 CAST-IN-PLACE CONCRETE CURBS**

- A. Cast-in-place concrete for curbs shall be air-entrained Class 4000 commercial concrete conforming to Section 6-02.3 of the Standard Specifications.
- B. Curb dimensions and installation shall be as shown on the Drawings.

## **PART 3 – EXECUTION**

### **3.01 CONCRETE FORMWORK**

- A. Prepare and place concrete formwork in accordance with the requirements of Section 03 10 00 – Concrete Forming and Accessories.
- B. Formwork shall be made available for inspection and modification at least 48 hours prior to concrete placement.

### **3.02 CONCRETE REINFORCEMENT**

- A. Fabricate and place steel bar reinforcement in accordance with the requirements of Section 03 20 00 – Concrete Reinforcement.
- B. Steel reinforcement shall be made available for inspection and modification at least 48 hours prior to concrete placement.

### **3.03 CONCRETE PLACEMENT**

- A. Inspection: 48hours prior to placing concrete, notify Owner for inspection of formwork, reinforcing steel and embedded or cast-in items. Notify other trades to permit installation of their work.
- B. General: Comply with ACI 304: Guide for Measuring, Mixing, Transporting, and Placing Concrete and as specified.
- C. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened sufficiently to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation at its final location.

**LUTHER BURBANK PARK WATERFRONT IMPROVEMENTS**  
**SECTION 32 13 13**  
**CONCRETE PAVING AND MISCELLANEOUS CONCRETE**

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- D. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers no deeper than 24 inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while the preceding layer is still plastic to avoid cold joints.
  - E. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete complying with ACI 309.
  - F. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the machine. Place vibrators to rapidly penetrate placed layer and at least 6 inches into the preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion, limit the duration of vibration to the time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing the mix to segregate.
  - G. Cold weather placement: Comply with provisions of ACI 306 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing action, or low temperatures.
  - H. When the air temperature has fallen to or is expected to fall less than 40°F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature no less than 50°F and no more than 80°F at the point of placement.
  - I. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
  - J. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.
  - K. Hot weather placement: When hot weather conditions exist that would impair quality and strength of concrete, place concrete complying with ACI 305 and as specified:
  - L. Cool ingredients before mixing to maintain concrete temperatures at the time of placement to less than 90°F. Mixing water may be chilled, or chopped ice may be used to control temperature, provided the water equivalent of ice is calculated to the total amount of mixing water. Using liquid nitrogen to cool concrete is the Contractor's option.
  - M. Cover reinforcing steel with water-soaked burlap if it becomes too hot so that steel temperatures will not exceed the ambient air temperature immediately before embedding in concrete.
  - N. Fog spray forms, reinforcing steel, and subgrade just before placing concrete. Keep subgrade moisture uniform without puddles or dry areas.
  - O. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, as acceptable to the Owner.

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**3.04 CURING**

- A. Maintain concrete between 65°F and 85°F (18°C to 29°C) during curing.

**3.05 CONCRETE FINISHING**

- A. Broom finish:
1. The surface shall be rodded across the screeds and smoothed with a “bull float” light steel trowel and broom finished. The general surface shall have no irregularities greater than 3/16 inch in depth or variations in grade of more than 3/8 inch in 10 feet. The broom strokes shall be approximately 1/8-inch deep. The slab shall be edged or patterned with a 2-inch-wide edging tool having a 3/4-inch corner radius. No shine on edge of slabs

**3.06 CONSTRUCTION JOINTS**

- A. Form all joints perpendicular to the main reinforcement. Continue reinforcing across joints unless otherwise indicated; provide longitudinal keys at least 1-1/2 inches deep at all joints in walls between walls and slabs or footings. Remove key forming wood inserts, and thoroughly clean surfaces of concrete at all joints before placing the next lift.
- B. Roughen surfaces of concrete at joints, and remove laitance to obtain bonds before placing next lifts; if the use of keys is impractical due to congestion or inaccessibility or if it is inadvisable to disturb a surface before it has hardened, use only the wet sandblast method for preparing surfaces.
- C. Dampen hardened concrete of joints between footings and walls, joints in unexposed walls, and all others not specifically mentioned here, and roughen by air/water cutting.
- D. Dampen hardened concrete joints in exposed work, and roughen by air/water cutting. Thoroughly cover joint surfaces with neat cement mortar of similar proportions to mortar in concrete; apply mortar as thick as practicable on vertical surfaces and a minimum of 1/2-inch thick on horizontal surfaces; place the next lift before the mortar has reached its initial set.
- E. For bonding new concrete to existing concrete, use a bonding agent. For grouting dowels and reinforcing bars, use specified adhesives in accordance with the manufacturer's instructions.
- F. Provide key forming wood inserts strips in walls; pour concrete to 1/2 inch above the lower edge or strip.

**3.07 CONTROL JOINTS/SAWCUTTING**

- A. The layout of the proposed jointing plan shall be established as soon as the concrete can take foot traffic.

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- B. The concrete joint pattern shall be saw cut with an early-entry concrete saw when the concrete has cured enough to provide a clean saw-cut edge.
  - C. In slabs on grade, saw cut control joints to true, straight lines with a maximum variance from true line of 1/4-inch in 10 feet and no irregularities across joints in excess of 1/8-inch; extend reinforcing steel through and lap beyond joints.
  - D. Grooves can also be wet set using a grove tool radiused 3/8"-1/2" wide upon approval

### **3.08 EXPANSION JOINTS**

- A. The layout of the proposed jointing plan shall be established as soon as the concrete can take foot traffic.
- B. Provide a pre-molded 3/8-inch-1/2" joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks, and other fixed objects, unless otherwise indicated.
- C. Locate expansion joints as noted on the Drawings.
- D. Extend joint fillers to full width and depth of the joint and no less than 1/2-inch or more than 1 inch below the finished surface where the joint sealer is indicated. Wherever possible, furnish joint fillers in one-piece lengths for the full width being placed. Where more than one length is required, lace or clip the joint filler sections together. Protect the top edge of the joint filler during concrete placement with a metal or plastic temporary strip. Remove protection after concrete has been placed on both sides of the joints before sealant is applied.
- E. Fillers and sealants: Install polyurethane sealant in a continuous, smooth joint, wiping excess sealant from adjacent concrete.
- F. Provide expansion joints no more than 30 feet apart in footings. Run no reinforcement or other metal trim continuous through joints unless otherwise indicated.

### **3.09 CAST-IN-PLACE CONCRETE CURBS**

- A. Form and subgrade preparation
- B. The foundation for concrete curbs shall be thoroughly compacted, and required side forms shall rest throughout their length on firm ground.
- C. Side forms shall meet the requirements of Section 8-04.3 of the Standard Specifications.
- D. Form and subgrade inspection is required by the Owner's Representative 24 hrs prior to pouring curbs.
- E. Cast-in-place concrete curb construction
- F. Expansion joints shall be constructed at no more than 15-foot intervals typically 10-foot intervals, the beginning and ends of curb returns, drainage structures, and cold joints with existing curbs and gutters. The Contractor shall fill the joint to full cross section with the specified remolded joint filler.

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- G. The Contractor shall apply mastic at joints with abutting concrete.
  - H. Apply a medium broom finish to horizontal surfaces of cast-in-place concrete curbs.
  - I. Apply a medium broom finish on vertical surfaces of curbs.

**3.10 NON-SHRINK GROUT**

- A. Apply in accordance with the manufacturer's direction; protect adjacent finished surfaces from defacement. Provide for sleeves where indicated.

**3.11 CLEANING**

- A. Leave premises clean and free of residue from work in this section.

**END OF SECTION**



**SECTION 32 14 13**  
**PRE-CAST CONCRETE UNIT PAVING**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. The work described in this section includes, but is not limited to, furnishing and placing pre-cast concrete unit paving and base materials for pedestrian areas.

**1.02 RELATED WORK**

- A. Work related to this section is described in the following:
  - 1. Section 01 33 00 – Submittal Procedures
  - 2. Section 03 30 00 – Cast-In-Place Concrete
  - 3. Section 31 00 00 – Earthwork
  - 4. Section 32 11 23 – Aggregate Base Courses
  - 5. Section 32 13 13 – Concrete Paving and Miscellaneous Concrete
  - 6. Section 33 40 00 – Storm Drainage Utilities

**1.03 REFERENCES**

- A. ASTM International (ASTM) C140 – Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units
- B. ASTM C131 Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
- C. ASTM C136 Method for Sieve Analysis for Fine and Coarse Aggregate
- D. ASTM C67 Test Methods for Sampling and Testing Brick and Structural Clay Tile, Section 8 Freezing and Thawing
- E. ASTM D448 Standard Classification for Sizes of Aggregate for Road and Bridge Construction
- F. ASTM C936 Standard Specification for Solid Interlocking Concrete Pavers
- G. ASTM C979 – Specification for Pigments for Integrally Colored Concrete
- H. ASTM D698 – Test Methods for Moisture Density Relations of Soil and Soil Aggregate Mixtures Using a 5.5-pound (lb.) (2.49-kilogram [kg]) Rammer and 12-inch (305-mm) Drop
- I. ASTM D1557 Test Methods for Moisture Density Relations of Soil and Soil Aggregate Mixtures Using a 10-lb. (4.54-kg) Rammer and 18-inch (457-mm) drop
- J. ASTM D1883 – Test Method for California Bearing Ratio of Laboratory-Compacted Soils
- K. ASTM D4254 – Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density

- L. Interlocking Concrete Pavement Institute Permeable Interlocking Concrete Pavement manual
- M. Washington State Department of Transportation Standard Specifications for Road, Bridge, and Municipal Construction, and Amendments (current edition)

#### **1.04 QUALITY ASSURANCE**

- A. Paver installation subcontractor qualifications:
  - 1. Utilize an installer having successfully completed at least five concrete paver or permeable interlocking pavement installations similar in design, material, and extent indicated for this project.
- B. Install a mock-up section for each type of paver to be installed, as follows:
  - 1. Install a 10- by 10-foot (3- by 3-meter) paver area.
  - 2. Use this area to determine surcharge of the bedding sand layer, joint sizes, lines, laying pattern(s), color(s), and texture of the job.
  - 3. This area will be used as the standard by which the work will be judged.
  - 4. Subject to acceptance by the Owner, the mock-up may be retained as part of finished work.
  - 5. If the mock-up is not retained, remove and properly dispose of it.

#### **1.05 SUBMITTALS**

- A. The Contractor shall submit the following for the approval by the Owner, in accordance with Section 01 33 00 – Submittal Procedures:
  - 1. The manufacturer's catalog sheets for each paver type showing paver unit dimensions, colors, product specifications, and installation instructions
  - 2. The manufacturer's material safety data sheets for the safe handling of the specified materials and products
  - 3. At least one representative full-sized sample of each paver type and each color including the full range of colors in each indicated blend.
- B. Sieve analysis of aggregates for base and bedding materials

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials in the manufacturer's original, unopened, undamaged container packaging with identification tags intact.
- B. Unload pavers at the job site in such a manner that no damage occurs to the product or existing construction.

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- C. Store materials in a protected area such that they are kept free from mud, dirt, and other foreign materials.

## **PART 2 – PRODUCTS**

### **2.01 PERMEABLE INTERLOCKING CONCRETE PAVERS**

- A. Permeable interlocking concrete paver units shall be Eco-Priora square or equal, meeting the following requirements.
1. Material standard: ASTM C936
  2. Color and finish: Integrally colored, charcoal, with color and pattern to be approved by the Owner
  3. Color pigment material standard: Comply with ASTM C979.
  4. Dimensions: Minimum 3-1/8 inches thick and nominal 8 by 8 inches
  5. Joint width: 3/8 inch
  6. Average compressive strength (ASTM C140): 8,000 lb. per square inch (psi) with no individual unit under 7,200 psi
  7. Average water absorption (ASTM C140): 5% with no unit greater than 7%
  8. Freeze/thaw resistance (ASTM C67): Resistant to 50 freeze/thaw cycles with no more than 1% loss of material; freeze-thaw testing requirements shall be waived for applications not exposed to freezing conditions.

### **2.02 JOINT FILLER, BEDDING AND BASE FOR PERMEABLE CONCRETE PAVERS**

- A. Base aggregates shall be crushed stone with 90% fractured faces, LA Abrasion less than 40 per ASTM C131, minimum California Bearing Ratio of 80% per ASTM D1883. Do not use rounded river gravel.
- B. All stone materials shall be washed with less than 1% passing the No. 200 sieve.
- C. Joint/opening filler, bedding, and base where the existing tieback slab is not present: conforming to ASTM D448 gradation as follows:

<b>ASTM NO. 8 BEDDING AND JOINT FILLER</b>	
<b>SIEVE ANALYSIS</b>	<b>% PASSING</b>
1/2-inch square	100
3/8-inch square	85–100
US #4	10–30
US #8	0–10
US #16	0–15

<b>ASTM NO. 57 GRAVEL BASE</b>	
<b>SIEVE ANALYSIS</b>	<b>% PASSING</b>
1-1/2-inch square	100
1-inch square	95–100
1/2-inch square	25–60
US #4	0–10
US #8	0–5

- D. Joint/opening filler and bedding where placed over existing tieback slab:
1. Provide Gator polymetric sand available from [www.alliancegator.com](http://www.alliancegator.com) or approved equal. Color to match pavers.

### **PART 3 – EXECUTION**

#### **3.01 SUBGRADE PREPARATION**

- A. Coordinate subgrade preparation with silva cell and paver underdrain installation.
- B. Excavate the subgrade as needed to accommodate the permeable pavers, joint filler, bedding, and base to achieve the grades shown on the Drawings.
- C. Do not compact subgrade beyond finished grading.

#### **3.02 PREPARATION**

- A. Verify that the subgrade is free from standing water.
- B. Verify that subgrade has been properly prepared and that utility and other underground work has been completed.
- C. Verify that curbs and other edge restraints are installed as shown on the Drawings.
- D. Do not install paver surfaces in rain or snow.
- E. Do not install frozen bedding materials.

#### **3.03 PERMEABLE INTERLOCKING PAVER INSTALLATION**

- A. General
  1. Remove any excess thickness of subgrade materials that may trap sediment prior to placement of base, bedding, pavers, and joint materials.
  2. Keep area where base, bedding, pavers, and joint materials are to be constructed free from sediment during entire job.

3. Protect and keep free from damage drainage pipes, valve boxes, manhole covers, catch basins, or any other utility appurtenances. Report any damage immediately to the Owner.
- B. Base (where existing tieback slab is not present)
1. Moisten, spread, and compact No. 57 base in a 4-inch lift over prepared subbase with a minimum 10-ton (T) vibratory roller until there is no visible movement of the No. 57 stone. Compaction should achieve 95% maximum dry density per ASTM D1557. Do not crush aggregate with the roller.
  2. The surface tolerance of the compacted No. 57 base should not deviate more than  $\pm 1/2$  inch over a 10-foot straightedge.
- C. Bedding (where existing tieback slab is not present)
1. Moisten, spread, and compact the No. 8 bedding material over the installed No. 57 material. Compact with a minimum 10-T static roller to 95% maximum dry density per ASTM D1557. Make at least four passes. No visible movement should occur in the base material when compaction is complete. Do not crush aggregate with the roller.
  2. The surface tolerance of the compacted surface should not deviate more than  $\pm 1/2$  inch over a 10-foot straightedge.
- D. Base (where existing tieback slab is present):
1. Install polymetric sand in the thickness needed for the top of the pavers to be flush with adjacent finished surfaces. Install per manufacturer's instructions.
  2. Adjust bedding thickness to achieve grades as shown in grading plans and to create a flush condition between pavers and adjacent surfaces noted on the plans as requiring a flush condition.
- E. Permeable interlocking concrete pavers and joint/opening fill material
1. Lay the pavers in the pattern(s) shown on the Drawings. Maintain straight pattern lines.
  2. Fill gaps at the edges of the paved area with cut units. Cut pavers subject to tire traffic shall be no smaller than one-third of a whole unit.
  3. Use a masonry saw to cut pavers placed along the edges.
  4. Compact and seat the pavers into the bedding material using a low-amplitude, 75- to 90-Hertz plate compactor capable of at least 22 kilonewtons (5,000 lb.) centrifugal compaction force. Complete at least two passes with the plate compactor.
  5. Do not compact within 6 feet of unrestrained edges of the paving units.
  6. Fill the openings and joints with No. 8 aggregate where installed where no existing tieback slab is present. Where installed over the existing tieback slab, fill openings and joints with polymetric sand.

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7. Remove excess aggregate or polymetric sand by sweeping pavers clean.
  8. Compact the pavers again, vibrating the aggregate into the openings. Apply additional aggregate to the openings and joints, filling them completely. Remove excess aggregate or polymetric sand by sweeping and compact the pavers. This will require at least two passes with the plate compactor.
  9. All pavers within 6 feet of the laying face must be left fully compacted at the completion of each day.
  10. The final surface tolerance of compacted pavers shall not deviate more than  $\pm 3/8$  inch under a 10-foot-long straightedge.
  11. The surface elevation of pavers shall be  $1/4$  inch above adjacent drainage inlets, concrete collars, or channels.

#### **3.04 FIELD QUALITY CONTROL**

- A. After sweeping the surface clean, check final elevations for conformance to the Drawings.
- B. Have no greater than a  $\pm 1/8$ -inch difference in height between adjacent pavers.

#### **3.05 PROTECTION**

- A. After work in this section is complete, the Contractor shall be responsible for protecting permeable paver surfaces from sediment deposition. The Contractor shall also be responsible for protecting all paver surfaces from damage due to subsequent site construction activity.

**END OF SECTION**

**SECTION 32 15 40  
CRUSHED STONE SURFACING**

**PART 1 – GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. The Work described in this section includes furnishing all labor, materials, tools, equipment, and incidentals required for placement and compaction of aggregate materials as top course and base course for gravel driveways and gravel pathways and for other miscellaneous Work including but not limited to:
  - 1. Crushed Surfacing Top Course
  - 2. Crushed Surfacing Base Course
  - 3. Crushed Stone Surfacing
  - 4. Stabilized Binder

**1.02 RELATED SECTIONS**

- A. Section 31 00 00 – Earthwork
- B. Section 32 11 23 – Aggregate Base Course

**1.03 REFERENCES**

- A. City of Mercer Island Codes, Design Criteria and Research available at:  
<https://www.mercerisland.gov/cpd/page/codes-design-criteria-research>
- B. Washington State Department of Transportation (WSDOT) – Standard Specifications for Road, Bridge, and Municipal Construction; and Amendments (2023 edition)
- C. ASTM International (ASTM) D 422 – Standard Test Method for Particle-Size Analysis of Soils
- D. ASTM D 1557 –Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 lb/ft<sup>2</sup>)
- E. ASTM D 2922 – Standard Test Methods for Density of Soil and Soil Aggregate in Place by Nuclear Methods

**1.04 QUALITY ASSURANCE**

- A. Installer Qualifications: Installers shall be trained and experienced in the skills required to perform the Work, familiar with the design and application of the Work described, and present at all times during progress of the Work in this section. The Contractor is responsible for verifying the quality of the Work and shall perform compaction and density

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tests on request of the Owner's Representative to check compliance with these Specifications. A copy of the test reports shall be furnished to the Owner's Representative.

- B. Codes and Standards: Work shall be performed in accordance with all pertinent codes and regulations and comply with the referenced portions of the current edition of the "Standard Specifications for Road, Bridge and Municipal Construction" as adopted by WSDOT and APWA and hereinafter referred to as "Standard Specifications."
- C. Layout: The Contractor is to layout and stake the location of all proposed paving and surfacing on the site for approval prior to construction.
- D. Notification: Notify the Owner's Representative at least 48 hours before placement of bases and paving.
- E. Testing:
  - 1. The Owner's Testing Agency may perform compaction and density tests to verify compliance with these Specifications. If it is determined that testing will be performed, verification that tests indicate placed materials meet the Specifications is required prior to commencement of subsequent construction that covers the tested material.
  - 2. The Owner may require that an independent testing laboratory test imported materials at any time. If the material is found to be noncompliant with the Contract, the Contractor shall bear the cost of testing and removal of all noncompliant materials from the project site, and replacement of the materials with those meeting the requirements of the Contract. If the materials tested are found to be compliant with the requirements of the Contract, the Owner will reimburse the Contractor for costs incurred by testing plus mark-ups as allowed for elsewhere in the Contract.

#### **1.05 SUBMITTALS**

- A. The Contractor shall submit the following for the approval by the Owner's Representative, in accordance with Section 01 33 00 – Submittal Procedures, and as further specified in this section:
  - 1. Imported Surfacing and Base Materials:
    - a. A particle gradation analysis in graph and table form, based on the sieve sizes in these Specifications, for each product specified in this section.
    - b. Manufacturer's product data sheet.
    - c. 1 quart sample of each aggregate specified.
    - d. Manufacturer's Material Safety Data Sheet.
    - e. Manufacturer's Warranty sheets.
- B. Products specified in this section shall be approved by the Owner prior to being imported to the site.



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**PART 2 – PRODUCTS**

**2.01 CRUSHED SURFACING BASE COURSE (CSBC):**

- A. CSBC consistent with WSDOT Standard Specifications Section 9-03.9(3).

**2.02 CRUSHED SURFACING TOP COURSE (CSTC):**

- A. CSTC consistent with WSDOT Standard Specifications Section 9-03.9(3).

**2.03 CRUSHED STONE SURFACING:**

- A. 1/4-inch Minus Crushed Rock (#4 to Dust), shall consist of crushed ledge rock or talus bearing no naturally occurring or worn surfaces. Gradation of the top course shall be as follows:

<b>Sieve Size</b>	<b>Percent Passing</b>
3/8-inch square sieve	100
No. 4 sieve	95 – 100
No. 8 sieve	75 – 80
No. 16 sieve	55 – 65
No. 30 sieve	40 – 50
No. 50 sieve	25 – 35
No. 100 sieve	20 – 25
No. 200 sieve	5 – 15

**2.04 STABILIZED BINDER:**

- A. Nontoxic, organic, stabilized binder applied to the crushed stone surfacing to produce a firm, stable surface shall be Stabilizer for Stabilized Aggregate surfaces provided by Stabilizer Solutions, Inc. 33 South 28th St., Phoenix, AZ 85034; phone (602) 225-5900, (800) 336-2468; fax (602) 225-5902; website stabilizersolutions.com; email info@stabilizersolutions.com, or approved equal.

**PART 3 – EXECUTION**

**3.01 CSBC AND CSTC**

- A. Refer to Section 32 11 23 – Aggregate Base Course.
- B. Place aggregate in maximum 6-inch lifts and compact to 95% of maximum dry density. Compaction shall be as required by Section 31 00 00 – Earthwork.
- C. Place base course aggregate and gravel base to thicknesses and elevations shown on the Drawings or as specified in Section 4 of the City of Mercer Island Design Standards. Place

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aggregate a minimum of 4 inches beyond the horizontal layout lines of pavement as indicated on the Drawings.

- D. Pavement Bases shall be graded such that upon approval of compaction, the surface of the base is at the correct elevation to receive pavement to design finished grade.

**3.02 CRUSHED STONE SURFACING**

- A. Provide a 2-inch compacted lift of specified crushed stone surfacing true to the elevations either described or implied by the Contract Drawings or as required by the Owner's Representative.
- B. Apply stabilized binder per the manufacturers recommendations.

**END OF SECTION**

**SECTION 32 17 23  
PAVEMENT MARKINGS**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. Extent of Work: The extent of Pavement Marking work is indicated on the Drawings. The Work includes the requirements for producing and placing pavement markings in conformance with these Specifications and the dimensions and sections indicated on the Drawings or within the lines and grades established by the Design Professional
- B. “Pavement Markings” is also referred to as “Striping” herein and on the Drawings, and the terms are used interchangeably. The two terms are the same and have the same requirements

**1.02 QUALITY ASSURANCE**

- A. Deliver materials to the site in Manufacturer’s original, unopened containers and packaging. All packaging shall be clearly labeled with the product name and manufacturer.

**1.03 REFERENCES**

- A. Washington State Department of Transportation (WSDOT) Standard Specifications for Road Bridge and Municipal Construction and Amendments (current edition).

**1.04 SUBMITTALS**

- A. Submittals shall be in accordance with Section 01 33 00 – Submittals and the Contractor shall submit the following for approval:
  - 1. Certifications and manufactures’ product data for pavement marking materials.
  - 2. Safety Data Sheets of each product, solvent, or related chemicals to be used, and certification that the materials conform to local, state, and federal environmental and worker’s safety laws and regulations.
  - 3. Standard color chip.
  - 4. Equipment List: Proposed equipment to be used, including descriptive data.
  - 5. Description of proposed methods for removal of drips, overspray, and improper markings.

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**1.05 PRODUCT HANDLING, DELIVERY, AND STORAGE**

- A. Deliver all materials to site in original, unopened containers bearing the following information:
  - 1. Name of Product
  - 2. Name of Manufacturer
  - 3. Date of Manufacturer
  - 4. Lot or Batch Number
- B. Store materials under cover and protected from the weather
- C. Replace containers showing any signs of damage with new material at no additional cost to Owner.
- D. Mix and prepare coatings only in areas designated by the Contractor for that purpose.
- E. Take precautions to prevent fire in or around coatings materials. Provide and maintain hand fire extinguisher near storage and mixing area.

**1.06 ENVIRONMENTAL REQUIREMENTS**

- A. Manufacturer and Contractor are required to confirm that all materials used in accordance with this Section conform to local, state, and federal environmental and workers' safety laws and regulations.
  - 1. VOC content of materials shall not exceed the limits per Environmental Protection Agency National Volatile Organic Compound Emission Standards for Architectural Coatings (40CRF59).
- B. The Contractor is solely responsible for fume control and shall take all necessary precautions against injury to personnel or adjacent building occupants during application. As a minimum, Contractor shall take the following precautions:
  - 1. Locate and protect building air intakes during application.
  - 2. Follow all state, federal, and local safety regulations.
  - 3. Follow all Manufacturers' safety requirements.
  - 4. Dispose empty containers immediately and properly.
  - 5. Use protective equipment.

**PART 2 – PRODUCTS**

**2.01 MATERIALS**

- A. Paint: Red or yellow traffic paint meeting the requirements of Section 9-34.2 of the WSDOT Standard Specifications.
- B. Color shall be as noted on the Drawings.

## **PART 3 – EXECUTION**

### **3.01 PREPARATION AND CLENAING**

- A. Preparation and cleaning shall be in conformance with Section 8-22.3(2) of WSDOT Standard Specifications.
- B. Immediately before application of the paint, the surface shall be dry and free from dirt, grease, oil, laitance, or other foreign material which would reduce the bond between the paint and the pavement. The area to be painted shall be cleaned by sweeping and blowing or by other methods as required to remove all dirt, laitance and loose materials.
- C. Any existing paint stripes shall be removed by grinding or scarifying so that no visible paint stripe remains in accordance with Section 8-22.3(6) of the WSDOT Standard Specifications.
- D. Report any discrepancies, interferences or changes in striping layout due to field conditions to the Design Professional prior to painting. Paint Contractor shall be required to remove paint, restore surface and repaint stripes not applied in strict accordance with the Drawings.
- E. Verify layout and placement of striping with the Design Professional before applying the marking paint.

### **3.02 MIXING**

- A. Do not mix different types of materials or materials from different Manufacturers.
- B. Do not thin material except as recommended by Manufacturer for spray application.
- C. Mix paint thoroughly by boxing, stirring or power agitation before use.

### **3.03 APPLICATION**

- A. Follow the construction requirements of Section 8-22 of the WSDOT Standard Specifications, except as shown otherwise on the Drawings or specified otherwise herein.
- B. Apply painting and finishing materials in accordance with the Manufacturer's directions. Use techniques best suited for the material and surfaces to which applied. Apply at 15 mils wet thickness.
- C. Weather Limitations: The painting shall be performed only when the surface is dry and the surface temperature is at least 45°F (7°C), and rising. Do not apply paint when relative humidity exceeds 85%, when rain is threatening, or late in the evening when dew might form before drying.
- D. Equipment: Equipment shall include the apparatus necessary to properly clean the existing surface, a mechanical marking machine, a bead and/or silica sand dispensing machine, and such auxiliary hand-painting equipment as may be necessary to satisfactorily complete the job. The mechanical marker shall be an atomizing spray-type marking machine suitable for application of traffic paint. It shall produce an even and uniform film thickness at the

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required coverage and shall apply markings of uniform cross sections and clear-cut edges without running or spattering and without over spray.

- E. Paint shall be applied at the locations and to the dimensions and spacing indicated on the Drawings. Paint shall not be applied until the layout and condition of the surface have been approved by the Design Professional.
- F. Protection: After application of the paint, all markings shall be protected from damage until the paint is dry. All surfaces shall be protected from disfiguration by spatter, splashes, spillage, or drippings of paint.

### **3.04 CLEANING**

- A. Immediately upon completion of work, clean up all paint spots, remove excess materials and equipment, and restore all paint damage to other finishes.

**END OF SECTION**

**SECTION 32 50 01**  
**NATURAL LOGS AND BOULDERS**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. Work described in this section includes furnishing all labor, materials, tools, equipment, and incidentals required to salvage on-site boulders and procure and install natural logs and additional boulders, as shown on the Drawings. This includes, but is not limited to, the following:
  - 1. Boulders
  - 2. Natural logs
  - 3. Chain, cable, and hardware
  - 4. Duckbill anchors and hardware
- B. All new materials in this section shall be imported and obtained by the Contractor.
- C. The Contractor shall calculate its own estimate of the quantity of material to be used for backfill and material placement activities based on the Contractor's own calculation methods, the excavation and design as shown on the Drawings, and the Contractor's means and methods for placement activities to account for the Contractor's equipment tolerances.

**1.02 APPROVAL AND SELECTION OF MATERIAL AND WORK**

- A. The placement of salvaged boulders and imported natural logs and boulders will be subject to the approval of the Engineer. The Owner will have the right to reject any and all salvaged or imported materials and any and all Work that, in the Owner's opinion, does not meet the requirements of the contract documents during any stage of construction. All rejected materials shall be removed from the site by the Contractor at the Contractor's expense.

**1.03 SUBMITTALS**

- A. Submit a list of sources for all materials to be imported and placed for approval prior to import. Coordinate with the Owner for pre-construction inspection of the source material-supplier facilities.
- B. For salvaged boulders, provide a photograph, dimensions, and the intended location for placement for approval prior to placing boulders.
- C. For imported logs and boulders, submit a photograph of each log and boulder. Provide source information for approval prior to installation.

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- D. For chains, cables, anchors, and hardware, submit product literature to the Owner for approval.

## **PART 2 – PRODUCTS**

### **2.01 BOULDERS**

- A. All salvaged and imported boulders shall meet the following requirements:
1. Boulders shall be natural granite-rounded boulders that weigh approximately 1,000 to 2,500 pounds. No angular rocks shall be used in place of natural-rounded boulders.
  2. The color of the boulders shall match that of existing rounded boulders associated with the beach access stone steps on site north of the south shoreline and east of the Parks Administration building.
  3. The Contractor shall obtain imported boulders from approved off-site sources, including Marenakos Rock Center (Preston, Washington: 425-392-3313) or other Owner-approved source.
  4. Boulders selected for import shall be marked by the Owner prior to being transported to the site. The Contractor shall give the Owner 5 days' notice to review rock selections prior to delivery.
  5. Boulders selected for salvage shall be photographed and the photo provided to the Owner prior to confirm suitability for reuse. The Contractor shall give the Owner 5 days' notice to review rock selections prior to installation.

### **2.02 IMPORTED NATURAL LOGS**

- A. Imported natural logs shall conform to the following requirements:
1. Sizes shall be 18 to 36 inches in diameter and 12 to 16 feet in length.
  2. Source species shall be of coniferous or deciduous of sufficient size, such as western hemlock, western red cedar, Douglas fir, or big leaf maple.
  3. Rootwads and branches shall be removed.
  4. Logs shall be free of significant rot and decay, bark, cable, bolts, other hardware, or any other objectionable foreign materials.
  5. Logs shall be washed of soil and debris prior to installation.

### **2.03 CHAIN, CABLE, AND HARDWARE**

- A. The chain shall be 3/4-inch plain steel (ungalvanized) lashing chain.
- B. The cable shall be 1/2-inch-diameter stainless-steel wire rope. The ends shall be swaged and held in place with two crimped fasteners at each end.
- C. Shackles for the chain-to-cable connection shall be 1/2-inch stainless steel.



**2.04 DUCKBILL ANCHORS AND HARDWARE**

- A. Duckbill anchors shall be Duckbill Earth Anchors available from MacLean Civil Products, LLC [(800) 325-5360].

**PART 3 – EXECUTION**

**3.01 PREPARATION**

- A. Soil preparation and shoreline materials such as soil, gravel, and rock shall be installed and approved by the Owner prior to installing natural logs and boulders.
- B. The Contractor shall locate natural logs and boulders by staking with stakes and flags as indicated on the Drawings or as approved in the field. If obstructions are encountered that are not shown on the Drawings, do not proceed until the Owner has approved the location.

**3.02 INSTALLATION OF NATURAL LOGS AND BOULDERS**

- A. Natural logs and boulders shall be constructed as shown on the Drawings.
- B. The Contractor shall alert the Owner's Representative at least 48 hours before placement of natural logs and boulders. The Owner's representative will be present during placement.
- C. All natural logs and boulders shall be placed on site as directed by the Owner's Representative or the Design Professional. Locations shown on the Drawings are approximate. The placement and orientation of each log shall be as directed by the Owner's Representative on site.
- D. After natural log placement locations are confirmed with the Owner's Representative in the field, install the Duckbill anchors per the manufacturer's instructions. Install Duckbill anchors so the looped end of the Duckbill anchor is 2 feet below the bottom surface of the natural logs, as shown on the Drawings. Attach the steel cable with the swaged end to the loop, as shown on the Drawings. Connect the steel cable to the chain at each natural log with the shackle. Tightly wrap the chain around the natural log. Natural logs shall be placed on existing beach surface and partially dug into the beach so there is no gap between the bottom surface of the logs and existing beach.

**END OF SECTION**

**SECTION 32 80 00**  
**IRRIGATION**

**PART 1 – GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes: Performance and material requirements for the design and installation of an efficient and fully automatic irrigation system.

**1.3 RELATED SECTIONS:**

- A. Section 31 00 00 Earthwork
- B. Section 32 81 13 Irrigation Intake Screens
- C. Section 32 82 10 Packaged Pump Systems
- D. Section 32 91 13 Soil Preparation and Erosion Control Fabric
- E. Section 32 92 00 Hydroseeding
- F. Section 32 93 00 Planting
- G. Section 33 12 17 HDPE Irrigation Distribution Piping
- H. Section 33 12 17 Irrigation Distribution Valves

**1.4 REFERENCES**

- A. WSDOT, Road and Bridge Standards
- B. ASTM D1785 - Standard Specification for Schedule 40 PVC Pipe
- C. ASTM D2241 - Standard Specification for PVC Plastic pipe
- D. ASTM D2466 - Standard Specification for Schedule 40 PVC fittings.
- E. ASTM D2466-78 - Schedule 80 PVC fittings
- F. ASTM D2564 - Standard Specification for PVC Solvent Cements
- G. ASTM D2855 - Standard Recommended Practice for making Solvent Cemented Joints with PVC Pipe and Fittings
- H. ASTM D3139 - Swing joint pipe and fittings
- I. ASTM F-656 - Standard Specifications for PVC Primers

**1.5 WORK INCLUDED**

- A. The Work covers a complete, automatically controlled, spray and drip irrigation system including: all required design criteria, trenching, backfilling and compacting; sleeving, installation of pipe, valves, fittings, and all other appurtenances; connections to water, testing; installation of controller, electrical connections, wiring, and system fine tuning. Coordinate all Work with other trades.

**1.6 REQUIREMENTS**

- A. Work and materials shall be in accordance with the latest rules, regulations and other applicable state or local-plumbing, electrical and health codes. Nothing in the Contract Documents is to be construed to permit Work not conforming to these codes.
- B. Obtain and pay for all permits, approvals and inspections required by the local jurisdictional authorities for the full operation of the system.

**1.7 SUBMITTALS**

- A. Refer to Division 01 for general submittal requirements.
- B. Product Data: Submit product data before beginning work. Include manufacturer's product literature for all products to be installed in this system. Include material showing manufacturer's name, catalog numbers, catalog cuts, technical data and installation, operation and maintenance instructions for each product.
- C. Point of Connection Water Pressure Test: Test water pressure at point(s) of connection. Verify pressure is in the range indicated on the drawings. Submit written results of test to the Owner's Representative.
- D. Maintain a current record of all pipe and equipment placement and record any variations approved by the Architect. Upon completion of the system and prior to release of final payment, provide a neat and legible record drawing of the completed system. Any pipe not installed in accordance with the plans as originally contracted shall be sufficiently dimensioned to a permanent structure for location after burial. Update record drawings DAILY.
- E. Digitally photograph all pipe, equipment placement, and installation progress on a daily basis. Note photograph locations on a separate record drawing. Include measuring tape, ruler, or other device in photograph to set scale. Digital photographs shall be .jpg format and minimum 72 dpi. Photographs shall be available to Owner's representative as needed. Upon completion of the irrigation system and prior to release of final payment, provide digital photograph files on DVD(s) or USB thumb drive along with legible record drawing of the photograph locations. Place in maintenance manual.

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- F. Maintenance Manuals: Provide minimum of two operation and maintenance manuals in digital format. The manuals shall be indexed and tabbed and include the following items/information:
1. List of authorized distributors and service representatives (in the area) for each item of irrigation equipment: include names, addresses and phone numbers.
  2. Guarantee/warranty certificates for all equipment used and Contractor's written warranty for entire system 1-year guarantee.
  3. Manufacturer's maintenance sheets, replacement parts list and equipment brochures for all equipment used. All composite data sheets shall have the specified products used in the field clearly highlighted.
  4. Winterization and Spring start up procedures.
- G. Product Data: Submit product data before beginning work. Include manufacturer's product literature for all products to be installed in this system. Include material showing manufacturer's name, catalog numbers, catalog cuts, technical data, installation, operation and maintenance instructions for each product.

## **1.8 QUALITY ASSURANCE**

- A. Qualifications: Washington State licensed landscape contractor with a minimum of three (3) years' experience installing irrigation systems of this scale.
- B. Work and materials shall be in strict accordance with the latest codes, regulations and other applicable state or local laws. Nothing in the Contract Documents is to be construed to permit work not conforming to these codes.
- C. Obtain and pay for all permits and approvals required by the local jurisdictional authorities for the full operation of the system.
- D. All work called for on the drawings by notes shall be furnished and installed whether or not specifically mentioned in the specifications. Do not install the sprinkler system as indicated on the drawings when it is obvious in the field that obstructions or graded conditions exist which cause discrepancies with the construction plans, details, legend or specific notes. All such discrepancies shall be brought to the attention of the Design Professional. In the event this is not done, the Contractor shall assume full responsibility for the necessary revisions.
- E. Due to the scale of drawings, it is not possible to indicate all offsets, fittings, sleeves, etc. which may be required. Carefully investigate the structural and finished conditions affecting all of this work and plan accordingly. Drawings are generally diagrammatic and indicative of the work to be installed. The work shall be installed in such a manner as to avoid conflicts between irrigation system, planting and architectural features.
- F. The work is subject to tests and inspections by the Design Professional specified. Furnish written notice to the Design Professional one week prior to the required test or inspection.

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- G. Winterizing the irrigation system shall occur between October 1 through November 15. No testing shall be performed after November 15. Winterizing and testing may be allowed outside these dates when approved in writing by the Owner's Representative. The irrigation system shall be activated no earlier than March 15, unless allowed otherwise by the Owner's Representative. Testing may be resumed at that time.

## **1.9 PROJECT CONDITIONS**

- A. Underground utilities and elements: Locate all underground utilities and elements prior to digging and/or driving stakes. Take care to neither disturb nor damage any existing above ground or underground utilities or elements. Keep streets, sidewalks and site clean, free from debris and affected drains open and free flowing at all times.
- B. Site inspection and layout: Before proceeding with any work, inspect the site, carefully check all grades and verify all dimensions and conditions affecting the work in order to proceed. Changes or alterations to the system to meet actual conditions shall be made at the Contractor's expense. Irrigation plan is diagrammatic and is not intended to show exact locations of existing or proposed piping or valves. Locate new items as closely as possible to related curbs, walls, fences or edges of paving. Pipelines shown parallel on drawing may be placed in a common trench but separated by at least 3 inches. Sprinkler heads are shown accurately and shall be installed as indicated by center of symbol.

## **1.10 DELIVERY, STORAGE, HANDLING AND PROTECTION**

- A. Protect work and materials from damage during construction and storage. PVC pipe and fittings shall be protected from ambient temperatures, weather and direct sunlight in accordance with manufacturer's written recommendations.
- B. Assume all responsibility for damage to adjacent construction and restore to its original condition should damage occur as a result of this work.
- C. Deliver products in sufficient quantities to allow a continuity of the work.

## **1.11 WARRANTY**

- A. Guarantee system against defects of installation and material for a period of 1 year after Owner's final acceptance of the irrigation system. Guarantee shall also cover repair or damage to any part of the premises resulting from leaks or other defects in material, equipment and workmanship to the satisfaction of the Owner. During guarantee period, check and clean filters, emitter, manually flush each zone and otherwise insure adequate operation of system at maximum one-month intervals during the operational year. Guarantee shall also cover repair or damage to any part of the premises resulting from leaks or other defects in material, equipment, and workmanship. Repairs, if required, shall be done promptly upon notification at no additional cost.

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- B. As part of the warranty, deactivate and drain the system prior to the onset of the freezing season and reactivate the system at the onset of the spring growing season. Each event must be accomplished once during the warranty period. In the event the system is completed in a season when it will not be in use, winterize the system upon completion of testing (and approval by the Design Professional and reactivate the system in the spring. Submit a letter certifying that the system was winterized and drained and indicate the date such action was accomplished. The Contractor is responsible for any damage resulting from failure to comply.

#### **1.12 SYSTEM FAMILIARIZATION**

- A. Before final acceptance of the system, provide the necessary keys and/or other tools required to operate, drain and activate the system. Provide two complete sets of tools and keys to the Owner (i.e.: water keys, quick coupler keys with hose swivel attachments, valve cover keys and controller keys).
- B. Provide 5% extra stock of each sprinkler type on project and 100 feet of Dripline for future maintenance use by Owner.
- C. Provide the following minimum standards of training with the Owner's personnel before final acceptance of the system.
- D. General system operation, maintenance and winterization—4 hours on site.

### **PART 2 – PRODUCTS**

#### **2.1 SUMMARY**

- A. All materials used throughout the system shall be new, unused, and in perfect condition. Refer to the irrigation materials legend, notes, detail drawings and these specifications for specific equipment to be used. Equipment or materials installed or furnished without prior approval of the Design Professional may be rejected and the Contractor will be required to remove such materials from the site at their own expense.

#### **2.2 PLASTIC PIPE AND ACCESSORIES (LATERAL LINES & ELECTRICAL CONDUIT)**

- A. PVC Pipe:
1. Marked with the manufacturer's name, class of pipe, NSF seal and date of manufacturing run. Pipe shall bear no evidence of interior or exterior extrusion marks. Conform to US Standard PS 22-70, ASTM D2241, ASTM D 1784, D3139, and D1869.
  2. Fittings: Schedule 40.
  3. Schedule 40 PVC pipe for mainlines; Schedule 40 PVC for laterals.
  4. All PVC pipe must be delivered in at least 20-foot lengths.

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5. Sleeves required for main and lateral lines located under paving shall be Schedule 40 PVC, with the inside diameter (I.D.) of sleeve to be twice the outside diameter (O.D.) of the insert pipe, maximum 1 insert pipe per sleeve. All wiring to be in separate sleeves from piping sleeves.
  6. Sleeves under roadways (street rights-of-way, boulevards or parkways) where heavy vehicular traffic is anticipated shall be ductile iron pipe, with the I.D. of the sleeve shall be at least 1 inch greater than the O.D. of the total inserted pipes. All wiring shall be in separate conduit sleeve.
  7. Fittings: PVC - ASTM D2464, D2466. Use Teflon tape on all threaded fittings.

**B. HDPE**

1. Electrical conduit: HDPE DR17
2. Conduit shall meet or exceed one or more of the following standards: ASTM F-2160, ASTM D-3035, ASTM D-2239, ASTM D-3485, NEMA TC-7, UL 651, UL 1990, Bellcore GR-356
3. Wall Type: Smooth inner and outer walls
4. Color: orange

**2.3 CEMENT & SOLVENT**

- A. Weld On 705 or 711 cement (grey)
- B. P-70 primer (purple).

**2.4 A. HYDROMETER:**

- A. Hydrometer (Master Valve): Size & type as indicated on drawings.
- B. Provide inline irrigation hydrometers for continuous measurement of system flow rate.
- C. Pressure Rating: Minimum 150 psi working pressure
- D. Hydrometers shall be furnished as part of the irrigation system, complete with required fittings and accessories for a complete installation.

**2.5 AUTOMATIC VALVES**

- A. Automatic Valve: Size & type as indicated on drawings.

**2.6 AUTOMATIC CONTROLLER**

- A. Type and size as shown on the Plans and Details.
- B. Final location of automatic controller shall be approved by Design Professional.

## **2.7 DECODERS**

- A. Type and size as shown on the Drawings.
- B. Install per manufacturer's instructions.

## **2.8 CONTROL WIRE FOR VALVES**

- A. This 2-Wire cable shall be either be Regency's Hunter® Jacketed Decoder Cable or Paige P7354D Jacketed. 14-gauge size.
- B. Each two-wire path shall consist of approved decoder cable specific to Weathertrak systems. The wire shall consist of two twisted solid-core copper wires, color-coded red and blue, within a polyethylene jacket for added durability. Jacket color as indicated on drawings.
- C. Wire conductors shall be 14 AWG.
- D. Trace wire: insulated, single strand copper designed for 24-50 volts and UL approved as UF (Underground Feeder). UL and UF designations clearly marked or embossed on the insulation jacket of the wire. Copper conductor must meet or exceed ASTM B-3 specifications. In no case shall wire be less than 14 gauge.
- E. Looped wires shall be provided within three (3) feet of each wire connection to solenoid.
- F. Copper conductors must meet or exceed ASTM B-3 requirements.

## **2.9 CONTROL WIRE FOR GROUNDING**

- A. 6 AWG bare copper wire
- B. 10' copper rod
- C. 4" x 36" copper grounding plate

## **2.10 DRIPPER TUBING WITH PRESSURE COMPENSATING EMITTERS**

- A. Irrigation Dripline: Type and size as shown on the Plans and Details. Or equal to meet the following specifications. No station shall exceed a flow of 15 gallons per minute.
- B. Nominal sized one-half (1/2) inch low density, ultra-violet-resistant, linear polyethylene tubing with internal pressure-compensating, self-cleaning, integral drippers with internal check valve at a specified interval.
- C. Dripline components: Netafim Dripline Inline Fittings, Netafim TLS6 stakes at 3 feet on center.

## **2.11 INSERT BARBED FITTINGS**

- A. Molded, ultra-violet-resistant, plastic of the following end configurations: barbed insert, male pipe threads (MPT) with barbed insert and female pipe threads (FPT) with barbed insert.



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**2.12 DISC FILTER**

- A. Molded black plastic filter body with male pipe threads (MPT) for both the inlet and outlet ports. A threaded cap on one end of the body shall be capable of periodic servicing by unscrewing the cap from the main filter body. On the 3/4-inch model, a manual shut-off valve shall be co-molded to the opposing end of the removable cap as part of the main body. This device shall be capable of closing off the inlet port so the disc element can be removed when the main line is still pressurized.
- B. The filter elements: disc-type or a canister screen filter. The disc-type shall be color-coded in one of four colors denoting filtration of 80, 120, 140, and 200 mesh. The canister-type screen shall be available in three levels of filtration, 80, 120, and 140 mesh.

**2.13 QUICK COUPLING VALVES**

- A. Type, manufacture and size(s) shown on the drawings. Install all quick coupling valves in a 10-inch diameter valve box as shown in the Details
- B. One (1) inch, all brass, and one or two piece bodies, with locking brass tops and have galvanized steel swing joints as shown in the Details. Provide two (2) operating keys and hose swivels.
- C. Quick coupler valve for use of compressed air for winterizing: one (1)-inch, all brass, two-piece bodies with locking brass tops. Provide one operating key.

**2.14 GATE VALVES**

- A. Gate valves: Types, manufacture, and sizes as shown on the Plans and Details.
- B. Gate valves 2 inches and larger: Flanged, iron body, brass trimmed, resilient double disc wedge, and integral taper seats with non-rising stem and square actuator. All gate valves shall be Class 150 with a minimum 150 psi - 300 WOG. Red and White or approved equal.
- C. Gate Valves one and one half inches (1-1/2 inch and smaller: All bronze construction with 'tee' handle, 175 psi water working pressure, Mueller Oriseal Mark II, Red and White or approved equal.

**2.15 POP-UP SPRINKLER HEADS**

- A. Types, manufacture and sizes shown on the Plans and Details.
- B. All heads shall have a built-in pressure-regulating device. The device shall regulate nozzle pressure to the design pressure. The pressure-regulating device shall be an internal part of the pop-up stem.
- C. The heads shall have matched precipitation rate nozzles with adjusting screws.
- D. The heads shall be equipped with check valves to prevent low head drainage. The check valves shall hold back pressures equivalent to 14 feet of head.

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**2.16 SWING JOINTS**

- A. Types, manufacture and sizes shown on the Plans and Details.
- B. Swing joints for quick couplers shall be installed in valve boxes, per the Details.
- C. Pre-fabricated swing joints, for irrigation heads, shall be triple swing joints. Swing shall consist of street ells, ells, and nipples for full adjustability. Fittings shall have "O" ring seals.

**2.17 VALVE BOXES**

- A. Type, manufacture and size shown on the Plans and Details and/or the following:
- B. NDS Professional Series 10" diameter round box (for drain valves, quick couplers and gate valves), green color.
- C. NDS Professional Series 13" x 20" x 12 with bolt down locking lid and extensions as required (for single valve only) green color.
- D. NDS Professional Series 17" x 30" x 18" with bolt down locking lid and extensions as required (use for two valves), green color.
- E. Use 10 round box for isolation valves and flush manifolds. NDS Professional Series 6" diameter pit box for air/vacuum relief valves and flush valves.
- F. Lids to be labeled: Automatic control valves - ACV, master valve boxes - MV, gate valves - GV, etc.

**2.18 IDENTIFICATION**

- A. Detectable marking tape: Christy's 3-inch detectable marking tape consists of a minimum 5 mil overall thickness; five ply composition; ultra-high molecular weight; 100% virgin polyethylene; acid, alkaline and corrosion resistant. The tape shall have a 20-gauge solid aluminum foil core, encapsulated within 2.55 mil polyethylene backing. Tape tensile strength shall be in accordance with ASTM D882-80A and be not less than 7,800 psi. Tape legend—Caution Irrigation Line Below. TA-DT-3-GI.
- B. Valve Markers: Christy's Identification Tags manufactured from polyurethane Behr Desopan, incorporating an integral attachment neck and reinforced attachment hole and will be capable of withstanding 180 pounds pull force. Tag shall be approximately 2.25 2.75 inches in size. All lettering will be hot stamped in black and capable of withstanding outdoor usage.
- C. Valve Number Markers: The standard alphanumeric designations shall incorporate lettering 1 1/8 inch in height. Tag color will be yellow. Marking tag will be double side stamped with zone valve number.
- D. Non-Potable Water Markers: Purple Christy's marker with Suffix #009, 'Warning Recycled Water Do Not Drink, Aviso Auga Impurano Tomar' with non-potable water graphics.

**2.19 BACKFILL MATERIAL**

- A. Backfill around all irrigation heads: common builder's sand or planting soil per planting specification.
- B. Bedding material for use around all pipes and equipment as shown on the Details: native topsoil with no rocks or other debris more than 1 inch diameter or common builder's sand.
- C. 3/8-inch washed round rock for valve box sump.

**2.20 ACCESSORIES**

- A. Vinyl Insulated Wire Connectors: Scotch-Lok #3570GN or 3M-DBY, Direct Bury Splice Kit.
- B. Stainless Steel Clamps: 304 AISI stainless steel, one "ear" type. The "ear" shall be capable of being pinched with a pinching tool to secure the tubing around the insert barbed fitting. Interior clamp wall shall be smooth to prevent crimping or pinching of tubing.
- C. Pressure Gauge: Fluid filled pressure gauge, dial pressure registered from 0 to 200 psi. Ashcroft 1009 AL with one quarter inch (1/4") gauge cock.

**PART 3 – EXECUTION**

**3.1 EXAMINATION**

- A. Prior to starting work, schedule pre-construction meeting with Design Professional. In addition, carefully inspect the preparatory work of other trades, and verify that such work is acceptable for the installation of the work of this Section. Report all unacceptable conditions to the Design Professional. Do not begin work until unacceptable conditions have been resolved. Beginning of work constitutes Contractor acceptance of conditions.

**3.2 LAYOUT**

- A. Layout in accordance with plans and details as shown on the drawings. Locate apparatus and equipment in planting areas where there is easy access for maintenance.
- B. If minor changes in location of irrigation equipment are required, or are directed by the Design Professional, work shall be accomplished by the Contractor at no additional cost to the Owner provided such changes are ordered before items or work directly connected to the same area are installed and provided no additional materials are required.

**3.3 TRENCHING**

- A. Trenches: Wide enough to allow a minimum of 3 inches between parallel PVC pipe lines. Prior to dripline installation trenches must be adequately tamped to prevent component separation due to settling. Dripline trenches must also be level for optimum flow

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distribution. Pipe lines depths to provide the minimum cover from finished grade as follows:

1. 18-inch cover from top of main lines.
  2. 12-inch cover from top of lateral lines.
  3. 6-inch cover from top of drip lines.
- B. Exercise care when excavating trenches near existing trees. Where roots are one and a half inches (1-1/2") and greater in diameter are encountered hand excavate and tunnel. When large roots are exposed, wrap with heavy burlap for protection and prevent excessive drying. Trenches dug by machines adjacent to trees having roots one and a half inches (1-1/2") and less in diameter shall have the sides hand trimmed making a clean cut of the roots. Trenches having exposed tree roots shall be back-filled within twenty-four (24) hours unless adequately protected with moist burlap or canvas.
- C. The top six (6) inches of soil shall be kept separate from subsoil and shall be replaced as the top layer when backfill is made.
- D. Excavate trenches with vertical sides and no wider at any point than is necessary to lay the pipe or install equipment. Locate outside of paved areas wherever possible.
- E. Materials unsuitable for bedding of pipe to be removed to a depth four (4) inches below trench bottom, and replaced with suitable bedding.
- F. All trenches must be straight, with appropriate pipe-fittings used to allow pipe to be laid without undue bending and not have abrupt changes in grade.
- G. The trench bottom must be free of rocks or sharp-edged objects.

### **3.4 PIPE AND FITTINGS**

- A. Cut PVC pipe ends at 90 degrees to the pipe length and clean all cutting burrs prior to cementing. Use of a deburring tool is highly recommended. Wipe pipe ends clean. Apply primer to both fitting and pipe end. Apply a light coat of cement on the inside of the fitting and a heavier coat on the outside of the pipe. Insert pipe into the fitting and given a quarter turn to seat the cement. Wipe excess cement from the outside of the pipe. Test pipe as indicated elsewhere in these specifications. Backfill the center of the pipe lengths until the pressure test is complete.
- B. Cure all welded joints at least 15 minutes before moving and 24 hours before water is permitted in the pipe.
- C. Ensure that the inside of the pipe is absolutely clean. Protect any pipe ends not being worked on. Cleaning of cutting burrs is MANDATORY.
- D. Where possible install PVC lines and valves adjacent to planter bed edges.
- E. Provide pipe sleeves double the diameter of the enclosed irrigation line(s). Use Schedule 40 PVC pipe for sleeves 3 inches and smaller. Install "link-seal" around interior pipe in sleeves to prevent soil erosion from planter bed.

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- F. Exercise care in handling, loading, unloading and storing to avoid damage. The pipe and fittings shall be stored under cover, and shall be transported in a vehicle with a bed long enough to allow the length of pipe to lay flat, so as not to be subject to undue bending or concentrated external load at any point. Any pipe that has been dented or damaged shall be discarded until such damage has been cut out and the pipe is rejoined with a coupling.
  - G. Appropriate primer shall be used with solvent glue. Solvent welded joints shall be given at least fifteen (15) minutes set-up time before moving or handling. Pipe shall be partially center loaded to prevent arching and slipping. No water shall be permitted in pipe until a period of at least 24 hours has elapsed for solvent weld setting and curing.
  - H. No PVC pipe may be threaded or connected to a threaded fitting without an adapter. Use Teflon tape on all male threads.
  - I. Great care must be taken to ensure that the inside of the pipe is absolutely clean. Any pipe ends not being worked on must be protected and not left open.

### **3.5 PIPE SLEEVES**

- A. Place Schedule 40 main line in PVC Schedule 40 sleeves under all paved areas, drives and roads. Sleeve shall be at least 1-1/2 inches larger than pipe diameter.
- B. Place Schedule 40 lateral lines in PVC Schedule 40 sleeves at least 1 inch larger than the pipe diameter under all paved areas, drives and roads.
- C. Sleeve trenches shall be back-filled with approved backfill material (6 inches minimum above and 4 inches below the pipe) and compacted in layers to 95% compaction, using manual or mechanical tamping devices. Trenches for piping shall be compacted to equal the compaction of the existing adjacent undisturbed soil and shall be left in firm unyielding condition. All trenches shall be left flush with the adjoining grade.
- D. Extend sleeves twelve (12) inches minimum beyond back edge of curbs and pavement. Provide temporary seal for pipe ends and mark locations at grade with wood stakes.

### **3.6 RISERS AND SWING JOINTS**

- A. All pop-up sprinkler heads and quick coupler swing joints must be constructed according to the Details.
- B. Minimum riser size shall be the pipe size of the sprinkler head.
- C. All threaded joints are to have Teflon tape (approved for PVC pipe) applied to male threads only.
- D. Risers are to be capped after installation in preparation for pressure testing.
- E. All pop-up sprinkler heads and quick couplers shall have swing joints that allow the head to be set perpendicular and flush with finish grades.

### **3.7 QUICK COUPLING VALVE**

- A. Install in 10" diameter valve box as shown in the Details.

### **3.8 HYDROMETER**

- A. Install the hydrometers at the locations shown on the Drawings, typically on the discharge piping downstream of the pump system and upstream of downstream isolation valves, unless otherwise indicated. Install the hydrometer in accordance with the manufacturer's written instructions.

### **3.9 AUTOMATIC VALVES**

- A. Flush supply lines before installing automatic valves. Install one union upstream of valve in manifold. Use valve box extensions to ensure that box extends a minimum of five (5) inches below the bottom of the box valve. Leave valve pit with a clean layer of gravel in the bottom with four (4) inch clearance (minimum) between gravel and bottom of valve.

### **3.10 CONTROL WIRES**

- A. Install in accordance with local code.
- B. Decoder wiring
  - 1. All splices made within the two-wire path shall be made using UL-listed waterproof connections rated to 600 VAC direct burial.
  - 2. All splices in the wire path shall be made within valve boxes, leaving a minimum of 3' slack in each valve box.
- C. Decoder grounding
  - 1. Surge-suppression devices designed for use with the decoder system shall be installed at a minimum of every 1,000' or every twelfth (12) decoder, whichever comes first.
  - 2. A surge-suppression device must also be installed at the very end of each two-wire path.
  - 3. The surge-suppression device must be completely waterproof, and shall include two of each color-coded wire leads, for connection to the two-wire path.
  - 4. Earth-ground hardware shall not be installed within the valve box.
  - 5. Each surge-suppression device shall have a single bare copper earth-ground lead, for connection to proper earth-grounding hardware.
  - 6. The bare copper lead shall be routed perpendicular to the two-wire path, at a minimum of eight (8) feet away from the two-wire path.

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- 7. Proper earth ground hardware typically consists of a ten (10) foot long copper-clad steel ground rod, or a copper plate of four (4) inch width and thirty-six (36) inch length.
  - 8. Nominal resistance of this earth-ground connection shall be approximately 10 ohms or less.
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- D. All splices must be contained within the valve box where a valve is installed. Allow sixty (60) inch minimum expansion coils for each connection so that the valve bonnet may be removed and placed outside the box for maintenance.
  - E. All splice to be made with vinyl insulated connectors and sealed in epoxy resin, control wires in trench prior to placing pipe. Cover control wires with minimum two (2) inches of approved backfill.
  - F. All wires shall be brought to the irrigation controller. Bring wires into the box through the conduit.
  - G. Control wires shall be installed in two (2) inch minimum HDPE DR17 electrical under all paved areas.

### **3.11 AUTOMATIC CONTROLLERS**

- A. Final location of controller approved by Owner's representative. The 120-volt electrical power to the controller is to be furnished by a licensed electrician. Irrigation Contractor is responsible for the low voltage valve electrical hookup.

### **3.12 SYSTEM FLUSHING**

- A. Flush entire system prior to the installation of valves, sprinkler heads and subsurface system components.

### **3.13 POP-UP SPRINKLER HEADS**

- A. Install per details. Spacing of heads shall not exceed spacing shown on the Plans for any reason.
- B. Heads along curbs, walks, paving, etc. shall be placed one half (1/2) inch above finish grade and no closer than four (4) inches from paving edge.
- C. All heads shall be set perpendicular to finish grade unless otherwise designated on the Plans.
- D. Backfill around heads with sand per the Details.

### **3.14 DRIPPER TUBING**

- A. Make minor adjustments to the location of emitters indicated of Irrigation Design Drawings as required to avoid conflicts with plantings and other obstructions. Do not increase or

decrease the number of lines per valve indicated without notification to and approval of the Resident Engineer.

- B. Dripper tubing can be installed in one of the three following methods:
  - 1. Over-excavation: In small areas, over-excavate the entire area to a depth of four (4) inches below finish grade. Plant all specimen trees and shrubs, fifteen (15) gallon size and larger, then place tubing at the row spacing interval indicated on the plan.
  - 2. Pipe Pulling: In larger areas where ground disruption is to be minimized, pneumatic tire, pipe pulling machinery shall be used. Pothole at the ends of each run for making connection to supply and exhaust headers of rigid PVC pipe. Maintain 4-inch cover.
  - 3. Trenching: See Trenching 3.3 above.
- C. Dripper tubing can be installed with the water outlets facing upward or downward. Offset the water outlets to form a triangular pattern throughout the tubing layout. In irregular areas, water outlets too close to fixed improvements shall be capped off with a dripper plug ring.
- D. Barbed Fittings: Connect dripper tubing to barbed fittings by pushing on and over both barbs until the tubing has seated against another piece of tubing or has butted against another portion of the barbed fitting.
- E. Pipe Clamping: When operating pressure exceeds 45 psi, stainless steel pipe clamps shall be used. Slip clamps over tubing before slipping tubing over insert barbed fitting. Place clamp between the first and second ridge of the barbed fittings and crimp the "ear" of the clamp tightly. Crimp the "ear" twice to ensure proper seating.

### **3.15 DISK FILTER**

- A. Install the disc filter, horizontally level, below grade and as indicated in the installation details. The position of the disc filter in the valve box shall be off-center to allow for removal of the disc element for periodic maintenance.

### **3.16 BACKFILLING**

- A. Back-filling shall be done when pipe is not in an expanded condition due to heat or pressure. Cooling of the pipe can be accomplished by operating the system for a short time before back-fill, or by back-filling in the early part of the morning before the heat of the day.
- B. In refilling the trenches, the fill around, 4 inches below, and 6 inches above the pipe and fittings shall be suitable bedding material or sand, as required, and tamped. The remainder of the backfill shall contain no lumps or rocks larger than 3 inches. A 3-inch separation is required between all pipes when more than one pipe occupies the trench.



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- C. All roots, rocks and surplus excavation shall be removed from the site unless otherwise directed. Any turf areas buried under ditch excavation shall be raked clean of any excavated material.
  - D. Trenches under roads or paved areas shall be back-filled and tamped with a mechanical tamper in successive six (6) inch lifts. Paving shall be replaced to the satisfaction of the Owner's Representative.
  - E. Prior to completing backfill, place bare copper wire directly above the installed lateral and supply mains and secure to pipe with tape for future line detection. Provide extra length to clearly expose ends in the valve boxes.
  - F. If, for any reason, any part of the sprinkler system is back-filled before approved location, testing, or inspection is authorized, it must be completely uncovered and exposed until approved for back-filling by the Owner's Representative.

### **3.17 PRESSURE TEST**

- A. Notify the Owner Representative at least 72 hours prior to the test.
- B. Testing will be rescheduled if air temperature is below 40 degrees Fahrenheit.
- C. Valves do not need to be installed for pressure test. Valve manifolds, quick couplers and drain valve swing joints may be capped. Purge all air from the mainline prior to testing.
- D. Hydrostatically test Lateral lines at test at existing static water pressure or 55 psi whichever is greater. Gate valve shall be closed. Swing joints shall be capped. To be valid, all tests must be performed under the direction and supervision of the Design Professional. Maximum allowable drop is 0 (zero) psi in a one half hour test.

### **3.18 CLEANING AND REPAIRS**

- A. Repair or replace any damaged materials, surfaces, and finishes caused by Work of this Section to the satisfaction of the Owner and at no additional cost to the Owner.
- B. Clean up as each portion as Work progresses. Remove refuse and excess dirt from the site and legally dispose of it off-site. All walks and paving shall be swept down.

### **3.19 PERFORMANCE TEST**

- A. Notify the Owner's Representative at least 72 hours prior to the test.
- B. Testing will be rescheduled if sustained wind speeds on site exceed 5 mph and air temperature is below 40 degrees Fahrenheit.
- C. Request Owner Representative attendance at the system coverage test. Give a minimum of (1)week prior notice. Prior to performance test, adjust valves, check emitters, check for leaks and coverage.
- D. Perform a system coverage test for each zone, in the presence of the Owner Representative. Repair any clogged or damaged irrigation components. Correct all

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deficiencies, without additional cost, until the system is approved by the Owner Representative. Test system for both manual and fully automatic operation.

**3.20 BALANCE AND ADJUSTMENT**

- A. Balance and adjust the various components of the sprinkler system so the overall operation of the system is most efficient. This includes a synchronization of the controllers, adjustments to pressure regulations, pressure relief valves, part circle sprinkler heads, drip emitters and individual station adjustments on the controller.

**3.21 MAINTENANCE TRAINING**

- A. Schedule a training session for the Owner's maintenance personnel for the operation of the system. Furnish sufficient training to the Owner's personnel in the operation, maintenance, and winterization of the system. The Owner Representative will be notified of this session at least 72 hours in advance and may be part of the training session. The Contractor shall be liable for all damages or losses resulting from failure to comply with the provisions of this paragraph.

**3.22 WINTERIZATION**

- A. Deactivate and drain the system prior to the onset of the freezing season and reactivate at the onset of the spring season. Accomplish each at least once during the warranty period. If construction is completed when the system is not in use, winterize after testing. Certify by letter the dates of winterization/activation. Repair damage from failure to comply.
- B. When using compressed air to winterize the system, do so in short cycles at no more than 40-psi air pressure. Do not allow pipe close to the compressor to get hot to the touch.

**3.23 FINAL APPROVAL**

- A. Upon completion of all tests, final approval for the system will be contingent upon Contractor providing signed and approved sprinkler/plumbing/health/electrical permits as may be applicable, as well as reproducible "as-built" drawings and three-ring binders of all catalog cuts/manufacture's instruction/maintenance and operation information as well as complete sets of all tools and keys required.

**END OF SECTION**

**SECTION 32 81 13**  
**IRRIGATION INTAKE SCREENS**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. This section describes requirements for furnishing and installing a self-cleaning cylindrical intake screen with internal spray nozzles, to be installed at the submerged inlet of the irrigation intake system in Lake Washington to prevent fish, debris, and other materials from entering the pipeline, while maintaining efficient flow conditions.

**1.02 REFERENCES**

- A. *National Oceanic and Atmospheric Administration (NOAA) Fisheries West Coast Region (WCR) Anadromous Salmonid Passage Design Manual* (NOAA 2023)

**1.03 SUBMITTALS**

- A. The Contractor shall submit the following in accordance with the Contract Documents:
  - 1. Intake Screen
    - a. Manufacturer's catalog data and Shop Drawings showing dimensions, nozzle layout, and connection details
    - b. Manufacturer's installation, operation, and maintenance manuals
    - c. Design flow and approach velocity confirmation
    - d. Certification that the screen meets the applicable requirements provided in the *NOAA Fisheries WCR Anadromous Salmonid Passage Design Manual*

**PART 2 – PRODUCTS**

**2.01 MATERIALS**

- A. Self-cleaning intake screen:
  - 1. Sure-Flow SCS2, or approved equal
  - 2. Screen Type: Cylindrical stainless steel intake screen with internal spray nozzles for self-cleaning functionality
  - 3. Construction: Fabricated entirely from Type 304 or 316 stainless steel in accordance with ASTM International A276

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4. Spray System: Internal spray nozzles driven by a portion of the pumped flow shall automatically clean the interior of the screen at regular intervals without the need for electrical power or external motors.
  5. Screen Slot Size: A maximum of 1/8 inch (3.2 millimeter), unless a finer slot size is indicated on the Drawings or required by regulatory agencies.
  6. Open Area: Minimum 50% open area to maintain low entrance velocity and minimize clogging
  7. Performance: Designed to operate with less than 1 pound per square inch head loss under clean conditions.
  8. Mounting: Include all necessary flanges, brackets, or other components to secure the unit to the pier structure.
  9. Compatibility: Sized to accommodate the design flow rate without exceeding a maximum approach velocity of 0.4 foot per second
  10. Compliance: The screen manufacturer shall certify that the screen complies with all local and federal regulations for screening and protecting anadromous fish, including requirements provided in the *NOAA Fisheries WCR Anadromous Salmonid Passage Design Manual*.

### **PART 3 – EXECUTION**

#### **3.01 FABRICATION AND WORKMANSHIP**

- A. Fabricate the screen system in accordance with the manufacturer's specifications. All welds shall conform to American Welding Society D1.6 standards. Components shall be free of defects and cleanly finished.

#### **3.02 INSTALLATION AND FIELD TESTING**

- A. The screen system shall be inspected upon delivery for completeness and damage.
- B. The Contractor shall install the screen per the manufacturer's recommendations.
- C. The Contractor shall coordinate with the manufacturer to provide on-site assistance during installation and startup as needed.
- D. The system shall be tested for cleaning functionality and proper operation in the presence of the Owner and Engineer.

**END OF SECTION**

**SECTION 32 81 14**  
**IRRIGATION FILTERS**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. This section describes requirements for furnishing, installing, and commissioning an automatic, self-cleaning filter for use in the irrigation pumping system.

**1.02 GENERAL REQUIREMENTS**

- A. The filter shall be designed to remove suspended solids, organic debris, and fine particulates from the irrigation water to protect downstream piping, valves, emitters, and equipment while maintaining continuous system operation during cleaning cycles.
- B. The filter shall utilize an automatic suction-scanning or equivalent internal cleaning mechanism that operates without interrupting system flow. Cleaning shall be initiated based on differential pressure across the filter element or by a programmable time interval. The system shall be suitable for installation as part of a packaged pump system or as a standalone inline filtration unit, as indicated on the Drawings.

**1.03 SUBMITTALS**

- A. The Contractor shall submit the following in accordance with the Contract Documents:
  - 1. Automatic Filter
    - a. Manufacturer's catalog data and technical specifications demonstrating compliance with the performance requirements of this Section.
    - b. Shop Drawings showing overall dimensions, inlet and outlet sizes, internal filter element, automatic cleaning mechanism, and required service clearances.
    - c. Description of the automatic cleaning system, including cleaning method, activation criteria (differential pressure and/or time-based), and backwash water requirements.
    - d. Pressure loss curves for clean and dirty filter conditions at the specified design flow rate.
    - e. Filter mesh size and material specifications.
  - 2. Filter Enclosure
    - a. Manufacturer's catalog data and technical specifications demonstrating compliance with the performance requirements of this Section.
    - b. Shop Drawings showing overall dimensions and required service clearances between the enclosure and the filter.

- c. Specifications for insulation or heating elements.
- 3. Electrical and Controls (if applicable)
  - a. Wiring diagrams and control schematics for automatic cleaning operation.
  - b. Power requirements and control interface details, including any solenoid valves, actuators, or control modules.
- 4. Operation and Maintenance Manuals
  - a. Manufacturer's installation, operation, and maintenance manuals.
  - b. Recommended inspection, cleaning, and replacement intervals for filter elements and internal components.
  - c. Troubleshooting procedures and spare parts list.

## **PART 2 – PRODUCTS**

### **2.01 FILTER REQUIREMENTS**

- A. Amiad 2-inch Mini Sigma Filter, or approved equal
- B. Filter Type: Automatic filter with internal suction-scanning, backwash, or equivalent self-cleaning mechanism.
- C. Operation: Automatic cleaning shall occur without interruption of system flow.
- D. Cleaning Activation: Initiated by differential pressure across the filter and/or programmable time-based control.
- E. Installation: Inline connections, including treaded, flanged, grooved-end, or union-type, suitable for the filter size and pressure class and suitable for horizontal or vertical installation as indicated on the Drawings.
- F. Serviceability: Filter shall be fully serviceable without removal from the pipeline.

### **2.02 HYDRAULIC PERFORMANCE**

- A. Design Flow Rate: Sized to accommodate the design flow shown on the Drawings or described in the Specifications without exceeding manufacturer-recommended velocities.
- B. Filtration Rating: Nominal filter mesh opening of 100 microns unless otherwise indicated on the Drawings.
- C. Clean Head Loss: Maximum of 3 psi at design flow under clean filter conditions.
- D. Dirty Head Loss (Cleaning Initiation): Automatic cleaning cycle shall initiate at a differential pressure not exceeding 7 psi.
- E. Backwash Flow: Cleaning cycle shall require no more than 2 percent of system flow.

### **2.03 FILTER ELEMENT**

- A. Type: Rigid or reinforced cylindrical filter.

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- B. Material: Stainless steel or polymeric material suitable for continuous submergence and irrigation water service.
  - C. Construction: Corrosion-resistant, non-deforming under maximum operating pressure.
  - D. Replacement: Filter element shall be removable and replaceable without specialized tools.

#### **2.04 MATERIALS OF CONSTRUCTION**

- A. Filter Body: Reinforced polymer or epoxy-coated metal suitable for outdoor irrigation service.
- B. Internal Components: Corrosion-resistant materials compatible with untreated surface water.
- C. Seals and Gaskets: EPDM or approved equal suitable for irrigation water service.

#### **2.05 AUTOMATIC CLEANING SYSTEM**

- A. Cleaning Mechanism: Internal suction scanner, rotating arm, or equivalent system that removes accumulated debris from the filter surface.
- B. Actuation: Hydraulic, electric, or pneumatic as provided by the manufacturer.
- C. Valves: Automatic backwash valve constructed of corrosion-resistant materials.
- D. Controls: Integral or remote-mounted controller capable of differential-pressure-based and/or timed cleaning cycles.

#### **2.06 PRESSURE RATING**

- A. Minimum Working Pressure: 40 psi.
- B. Maximum Working Pressure: 150 psi, unless otherwise indicated on the Drawings.

#### **2.07 ALUMINUM ENCLOSURE**

- A. Provide a lockable, weather-resistant aluminum enclosure to house the irrigation filter and associated appurtenances.
- B. General Requirements
  - 1. Exterior-grade aluminum enclosure suitable for permanent outdoor installation.
  - 2. Durafold DF2100L, or approved equal. Contractor to verify size before ordering.
- C. Construction
  - 1. Material: Marine-grade aluminum with corrosion-resistant finish.
  - 2. Panels: Rigid, reinforced aluminum panels with hinged access doors.
  - 3. Doors: Lockable doors with stainless steel hinges and hardware.
  - 4. Ventilation: Provide louvered or screened ventilation openings to prevent overheating while limiting ingress of debris and pests.
  - 5. Roof: Weather-tight roof designed to shed rainwater.

- D. Size and Clearance
  - 1. Enclosure shall be sized to provide adequate clearance for:
    - a. Operation of valves and controls
    - b. Removal and servicing of the filter element
    - c. Access to backwash connections and fittings
  - 2. Minimum clearances shall comply with the filter manufacturer's installation and maintenance requirements.
- E. Foundation and Anchorage
  - 1. Enclosure shall be anchored to a concrete slab or pad per manufacturers recommendations.
  - 2. Provide anchorage hardware compatible with aluminum construction and exterior exposure.
- F. Compatibility
  - 1. Enclosure design shall accommodate inlet, outlet, and backwash piping penetrations without compromising weather resistance.
  - 2. Coordinate enclosure layout with irrigation piping, valves, and filter orientation.

### **PART 3 – EXECUTION**

#### **3.01 FABRICATION AND WORKMANSHIP**

- A. Fabricate the automatic filter and associated components in accordance with the manufacturer's published standards and approved submittals.
- B. All components shall be factory-assembled, tested, and free of defects in materials and workmanship. Wetted components shall be clean and suitable for irrigation water service. Threads, flanges, and sealing surfaces shall be protected during shipment and handling.

#### **3.02 INSTALLATION AND FIELD TESTING**

- A. Inspect the filter system upon delivery for completeness and damage. Do not install damaged components.
- B. Install the automatic filter in accordance with the manufacturer's written instructions and approved Shop Drawings.
- C. Install filter in the orientation shown on the Drawings and provide adequate clearance for filter removal, servicing, and inspection.
- D. Provide isolation valves upstream and downstream of the filter to allow maintenance without draining the system.
- E. Connect inlet, outlet, and backwash piping using compatible fittings and materials as specified.



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- F. Route backwash discharge piping to the location indicated on the Drawings and coordinate with site drainage features to prevent erosion or flooding.
  - G. Coordinate electrical power and control wiring with Division 26 and other applicable sections.
  - H. Verify that pressure differential sensing ports and tubing are properly installed and unobstructed.

### **3.03 FIELD QUALITY CONTROL AND STARTUP**

- A. Engage the manufacturer's authorized representative or qualified installer to perform startup, testing, and calibration of the automatic filter.
- B. Verify the following prior to acceptance:
  - 1. Proper operation of the automatic cleaning mechanism under normal flow conditions.
  - 2. Activation of cleaning cycles based on differential pressure and/or programmed time intervals.
  - 3. Acceptable pressure loss across the filter at design flow.
  - 4. Proper operation of backwash valves and discharge routing.
  - 5. No leakage at flanged, grooved, or threaded connections.
- C. Demonstrate automatic cleaning operation in the presence of the Owner and Engineer.

### **3.04 TRAINING**

- A. Provide on-site instruction for the Owner's personnel following successful startup.
- B. Training shall include:
  - 1. System operation and control functions
  - 2. Cleaning cycle logic and settings
  - 3. Routine inspection and maintenance procedures
  - 4. Troubleshooting and alarm conditions
  - 5. Submit training documentation, including agenda and attendance record, to the Owner.

**END OF SECTION**

**SECTION 32 82 10  
PACKAGED PUMP SYSTEMS**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. This section includes the requirements for procurement, installation, and startup of a fully integrated, prepackaged pump system including all required instrumentation for irrigation water supply use.

**1.02 RELATED SECTIONS**

- A. Section 31 00 00 – Earthwork
- B. Section 32 13 13 – Concrete Paving and Miscellaneous Concrete
- C. Section 32 80 00 – Irrigation
- D. Section 32 81 13 – Irrigation Intake Screens
- E. Section 32 81 14 – Irrigation Filters
- F. Section 33 11 17 – HPDE Irrigation Distribution Piping
- G. Section 33 12 17 – Irrigation Distribution Valves
- H. Section 33 46 00 – Subdrainage

**1.03 SUBMITTALS**

- A. Product Data:
  - 1. The manufacturer's technical data sheet for the packaged pump system and all major components, including pumps, fittings, other appurtenances, controllers, electrical connections, and the aluminum enclosure.
  - 2. Performance curves indicating pump flow and head characteristics.
- B. Shop Drawings:
  - 1. Dimensioned general arrangement drawings.
  - 2. Wiring schematics and control panel layout.
- C. Power Supply:
  - 1. Submit design documents for the electrical power supply and connection to the packaged pump system. Submittals shall include:
    - a. One-line electrical diagram showing the power source, disconnects, overcurrent protection, grounding, and connection to the packaged pump system

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- b. Conduit routing, sizes, and burial requirements between the power source and pump system
    - c. Identification of voltage, phase, available fault current, and coordination with the packaged pump system electrical requirements
    - d. Confirmation of compliance with NFPA 70 and applicable local electrical codes
  - 2. Power supply design submittals shall be prepared by a qualified electrical professional and shall be coordinated with the packaged pump system manufacturer's requirements.
- D. Factory Performance Tests:
- 1. Test results demonstrating successful factory testing of the package pump system prior to delivery.
  - 2. Factory pump test curves and data.
- E. Operation and Maintenance Manuals:
- 1. Startup procedures, troubleshooting, and maintenance schedules.
- F. Certificates:
- 1. UL Listings, variable-frequency drive (VFD) documentation, and compliance with NFPA 70

#### **1.04 QUALIFICATIONS**

- A. Use personnel adequately trained, qualified, and certified to perform the Work needed to complete installation, startup, and testing of the packaged pump system.
- B. Provide the appropriate equipment needed to unload and install all pump system components.
- C. Electrical design and installation associated with establishing the power supply connection to the packaged pump system shall be performed by a licensed electrical contractor qualified to perform work in the project jurisdiction. The electrical contractor shall have demonstrated experience with power supply connections for packaged pump systems or similar electrically driven mechanical equipment.

#### **1.05 QUALITY ASSURANCE**

- A. The manufacturer shall have a minimum of 5 years of documented experience in the design and fabrication of packaged irrigation pump systems.
- B. The packaged pump system shall be UL listed under UL QCZJ and include UL NITW-listed control panels.
- C. Equipment installation, startup, and testing shall be performed by personnel trained and certified by the manufacturer.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver the packaged pump system to the site fully assembled, factory tested, and protected from damage.
- B. Store the pump system indoors or cover with waterproof sheeting.
- C. Protect components from dirt, debris, freezing, and UV exposure.
- D. Comply with manufacturer's recommendations for lifting and installation procedures.

**PART 2 – PRODUCTS**

**2.01 PUMP SYSTEM MANUFACTURER**

- A. Rain Bird Corporation, Model ACLP07JAC Compact Low Profile 7.5HP VFD Pump Station, or approved equal.
- B. Substitutions: Submit requests for substitutions in accordance with the contract documents. Proposed products must meet or exceed specified requirements and be approved by the Owner prior to ordering.

**2.02 PUMP SYSTEM COMPONENTS**

- A. Model: Rain Bird ACLP07JAC compact low profile 7.5-horsepower VFD packaged pump system, or approved equal
- B. Operating Conditions:
  - 1. Design Operating Point: 40 gpm at 85 psi
- C. Pump:
  - 1. Type: Horizontal, end-suction centrifugal pump
  - 2. Motor: 7.5 horsepower, totally enclosed fan cooled
  - 3. Controls: Integrated VFD for pressure regulation and energy efficiency
- D. Enclosure:
  - 1. Construction: Marine-grade aluminum with corrosion-resistant finish
  - 2. Access: Lockable hinged lid and removable front access panel
  - 3. Ventilation: Integral exhaust fan for enclosure cooling
- E. Piping:
  - 1. Connections: 3-inch grooved-end intake and discharge piping
  - 2. Materials: Stainless Steel
- F. Valves:
  - 1. Suction and discharge isolation butterfly valves
  - 2. Check valve on discharge piping

- G. Instrumentation:
  - 1. Pressure Gauges: Liquid-filled pressure gauges on suction and discharge
  - 2. Priming: 1/2-inch NPT priming port
  - 3. Transducer: Stainless-steel pressure transducer for VFD feedback
  - 4. Flow Switch/Flow Sensor: Factory-provided flow switch/flow sensor for low-flow verification/control functions
- H. Electrical:
  - 1. Control Panel: UL-listed (UL NITW) pre-wired control panel with labeled terminal blocks
  - 2. Disconnect: External NEMA 3R fused main power disconnect switch
  - 3. Relay: 24-volt AC/DC pump start relay for remote operation
  - 4. Indicators: External red LED for fault and green LED for pump run status
  - 5. Power: Available in single-phase 208/230 volts or three-phase 208/230/480 volts
  - 6. the Contractor shall verify site voltage and Owner preference before ordering.
- I. Accessories:
  - 1. Bladder Tank: 4-gallon capacity, pre-charged, with replaceable bladder
- J. Pipe and Equipment Supports:
  - 1. Provide adjustable pipe and equipment supports as required to support above-ground piping, valves, and filtration equipment associated with the packaged pump system, including the Mini Sigma filter.
  - 2. Supports shall be designed to accommodate dead loads, operating loads, thermal movement, and vibration.
  - 3. Coordinate support locations and attachment details with the Engineer.
  - 4. Install supports in accordance with equipment manufacturer recommendations.
  - 5. Anvil Adjustable Pipe Support Figure 264, or approved equal

## **2.03 PERFORMANCE FEATURES**

- A. Intelligent Control Logic:
  - 1. Automatically starts pump upon detection of low system pressure
  - 2. Automatically shuts down on sustained low-flow conditions verified by pressure sensor
  - 3. Shuts down on dead head conditions (no flow at operating pressure)
  - 4. Issues alarms and shuts down on:
    - a. Loss of prime
  - 5. Pipe break (rapid pressure drop)
  - 6. Transducer signal failure

## **PART 3 – EXECUTION**

### **3.01 SITE PREPARATION**

- A. Perform excavation, grading, and foundation preparation in accordance with Section 31 00 00 – Earthwork.
- B. Ensure slab or foundation is level and dimensioned per manufacturer's recommendations, and is constructed in accordance with Section 32 13 13 – Concrete Paving and Miscellaneous Concrete, prior to pump system placement.

### **3.02 POWER SUPPLY**

- A. The Contractor shall be responsible for the design, furnishing, and installation of the complete electrical power supply to the packaged pump system and instrumentation from the electrical panel located in the adjacent boiler building.
- B. All electrical work associated with establishing power to the pump system shall be performed by a licensed electrical contractor in accordance with NFPA 70, applicable local codes, and the packaged pump system manufacturer's requirements.
- C. The Contractor shall provide all conduit, conductors, disconnects, grounding, supports, and appurtenances necessary to deliver a complete, code-compliant, and operational power supply connection to the packaged pump system.
- D. Electrical power supply design and installation shall be coordinated with the packaged pump system manufacturer to verify voltage, phase, available fault current, and compatibility with the pump system control panel.
- E. Power supply design documents shall be submitted for review in accordance with Part 1.03 – Submittals prior to installation.

### **3.03 INSTALLATION**

- A. Coordinate installation with utility, electrical, and other trades.
- B. Anchor pump system to concrete pad using manufacturer-provided lifting points and anchoring hardware.
- C. Field-connect suction and discharge piping using grooved couplings as specified.
- D. Install pump system and appurtenances in accordance with the manufacturer's written instructions and approved Shop Drawings.
- E. Maintain minimum service clearances as shown on the manufacturer's submittals.
- F. Install backwash spray line from discharge header to intake strainer.

**3.04 FIELD QUALITY CONTROL**

- A. Engage the manufacturer's authorized technician to perform pump system startup, functional testing, and system calibration
- B. Verify the following:
  - 1. Proper operation of VFD, pressure transducer, and alarm conditions
  - 2. That control logic responds to startup/shutdown sequences as specified
  - 3. That all gauges, indicators, and panel components operate correctly
- C. Submit commissioning report in accordance with the Contract Documents.

**3.05 TRAINING**

- A. Provide a minimum of 2 hours of on-site training for the Owner's personnel following startup.
- B. Training shall include the following:
  - 1. System operation and controls
  - 2. Routine maintenance procedures
  - 3. Alarm response and troubleshooting
- C. Submit training agenda and attendance record to the Owner for documentation.

**END OF SECTION**

**SECTION 32 91 13**  
**SOIL PREPARATION AND EROSION CONTROL FABRICS**

**PART 1 – GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. The Work described in this section includes furnishing all labor, materials, tools, equipment, and incidentals required for placement of:
  - 1. Compost
  - 2. Topsoil
  - 3. Coir fabric

**1.02 QUALITY ASSURANCE**

- A. All products supplied shall comply with applicable state and local codes.

**1.03 RELATED SECTIONS**

- A. Section 01 57 13 –Temporary Erosion and Sediment Control
- B. Section 31 10 00 – Site Clearing
- C. Section 31 00 00 – Earthwork Moving

**1.04 SUBMITTALS**

- A. Submit the following to the Owner's Representative for visual inspection and approval:
  - 1. Compost and topsoil: A 5-pound bag with soil analysis tests.
  - 2. Topsoil: A visual inspection and approval by the Owner's Representative of the source material at the proposed supplier's location.
  - 3. Compost: Trip tickets or other verification of the quantity of compost delivered to the site meeting the requirements of RCW 43.19A.
- B. Submit the following material certification/data sheets:
  - 1. Coir fabric

**1.05 PROJECT CONDITIONS**

- A. Keep streets and the site clean and free from debris and affected drains open and free-flowing at all times. Protect drains with filter fabric covers during construction. Appropriate erosion control measures shall be employed.



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**PART 2 – PRODUCTS**

**2.01 TOPSOIL**

- A. The topsoil mix shall consist of 60% sand components and 40% composted organic amendment by volume and shall meet or exceed the following specifications:
1. The sand component shall be a sandy loam and meet the following specifications within reasonable variations:

Screen Size	Percent Passing
6.35 millimeters	95
No. 10	85
No. 30	50
No. 60	40
No. 100	20
No. 200	10

2. The composted organic amendment shall consist of 100% decomposed organic mulch material and shall consist of yard waste debris or other organic waste materials that have been sorted, ground up, aerated, and aged and shall be fully composted, stable, and mature (nonaerobic). The composting process shall be for at least 6 months, and the organic amendment shall have a uniform dark, soil-like appearance and consist of 100% recycled content. In addition, the organic amendment shall have the following physical characteristics:
  - a. Shall be certified by the Process to Further Reduce Pathogens (PFRP) guideline for hot composting as established by the U.S. Environmental Protection Agency (EPA)
  - b. Shall be fully mature and stable before usage
  - c. Shall be screened using a sieve no finer than 1/4-inch and no greater than 1/2-inch. Based on dry weight of total organic amendment sample, it must comply with the following percent by weight passing:

Sieve Size	Maximum %	Minimum %
12.7 millimeters [1/2 inch]	0	100
6.35 millimeters [1/4 inch]	100	95
4.76 millimeters	100	90
2.38 millimeters	100	75
1.00 millimeter	45	70
500 microns	30	0

- d. Meets “composted materials” definition in Washington Administrative Code 173-350 Section 220, available at:  
<http://www.ecy.wa.gov/programs/swfa/compost/>.

**LUTHER BURBANK PARK WATERFRONT IMPROVEMENTS**  
**SECTION 32 91 13**  
**SOIL PREPARATION AND EROSION CONTROL FABRICS**

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- e. Has organic matter content 35% to 65% and a carbon to nitrogen ratio of 25 to 1
  - f. Shall have heavy metal concentrations below the Washington State Department of Agriculture (WSDA) per-year load limits as follows:

<b>Metal</b>	<b>WSDA Maximum Pounds per Acre per Year</b>
Arsenic	0.297
Cadmium	0.079
Cobalt	0.594
Lead	1.981
Mercury	0.019
Molybdenum	0.079
Nickel	0.713
Selenium	0.055
Zinc	7.329

- g. Shall be certified by PFRP guidelines for composting as established by EPA
- B. The topsoil mix shall also have the following characteristics:
- 1. The pH range shall be from 5.5 to 7.5.
  - 2. The sodium adsorption ratio shall be less than 6.0.
  - 3. The saturation extract concentration of boron shall be less than 1.0 part per million.
  - 4. The water percolation/infiltration rate of the disturbed soil sample shall be a minimum of 0.4 inch per hour.
  - 5. The soil structure shall be loose, friable, and not subject to consolidation or compaction.
  - 6. The soil mix shall contain less than 100 plant parasitic nematodes per 100 cubic centimeters of soil.
  - 7. The soil mix shall be free of soil-borne plant pathogens.
  - 8. Minimal weed seed shall be present, based on germination testing of a representative sample.
  - 9. Non-soil components (e.g., plastic, sticks, and glass) shall be less than 1% by volume.
- C. The final topsoil mix shall contain sufficient quantities of available nitrogen, phosphorus, potassium, calcium, magnesium, sulfate, copper, zinc, manganese, iron, and boron to support normal plant growth. In the event of nutrient inadequacies, provisions shall be made to add required materials prior to planting.
- D. The Contractor shall submit soil analysis results from the soils testing laboratory to the Owner's Representative. Indicate sources, and obtain the Owner's Representative approval before hauling to the site. An analysis test of a 5-pound-bag sample is required.
- E. Salvaged on-site topsoil may be used if it meet's design specification.

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**2.02 COIR FABRIC**

- A. Erosion control fabric shall be of a uniform, open, plain weave of unbleached, single jute yarn. The yarn shall be of a loosely twisted construction and shall not vary in thickness by more than half of its normal diameter. Erosion control fabric shall be furnished in rolled strips approximately 50 yards in length. Erosion control fabric width shall be 48 inches with an average weight of 0.92 pound per square yard. A tolerance of plus or minus 1 inch in width and 5% in weight will be allowed.

**2.03 WOOD STAKES FOR EROSION CONTROL FABRIC**

- A. Stakes shall be 2- by 2-inch Douglas fir with one tapered end, 2 feet in length. No split or badly splintered stakes will be accepted.

**PART 3 – EXECUTION**

**3.01 PREPARATION OF SUBGRADE**

- A. Obtain the Owner's Representative approval of subgrade prior to Work in this section. Grub areas as specified in Section 31 10 00 – Site Clearing. Subgrade elevations shall be set to accommodate the depth of the topsoil as specified on the Drawings. A 0.10-foot tolerance shall be allowed.
- B. Any exposed tree roots in cut slopes shall be cleanly cut at the finish grade.

**3.02 PLACING TOPSOIL**

- A. Topsoil
  - 1. Scarification: Scarify or till subgrade to a minimum depth as noted on the drawings. The entire surface should be disturbed by scarification. Do not scarify within the dripline of existing trees to be retained.
  - 2. Place half of the total depth of planting soil, and thoroughly rototill or hand-mix soil into the depth noted on the drawings of the prepared subgrade in areas indicated on the Drawings. Install the second lift of the remaining depth, and perform fine grading.

**3.03 FINE GRADING**

- A. Perform fine grading to attain finish grades as shown on the Drawings.
- B. Rake all rocks, roots, sticks, and other debris larger than 1 inch in diameter or sticks longer than 3 inches. Leave surfaces even and readily able to accommodate planting installation. For compaction, refer to Section 31 00 00 – Earthwork.

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**3.04 COIR FABRIC INSTALLATION**

- A. Erosion control fabric shall be provided in locations as shown on the Drawings.
- B. Immediately following the establishment of the finished grade, erosion control fabric shall be unrolled parallel to the flow of water. Where more than one strip of erosion control fabric is required to cover the given area, it shall overlap the adjacent fabric by a minimum of 4 inches. The upslope end of each strip of erosion control fabric shall be staked and buried in a 6-inch-deep trench with the soil firmly tamped against the mat. Three stakes per width of fabric (one stake at each overlap) shall be driven below the finish ground line prior to backfilling the trench. The Owner may require that any other edge exposed to more than the normal flow of water or strong prevailing winds be staked and buried similarly.
- C. The edges of erosion control fabric shall be buried around the edges of catch basins and other structures. Erosion control fabric must be spread evenly and smoothly and be in contact with the soil at all points.
- D. Erosion control fabric shall be held in place by approved wooden stakes driven vertically into the soil. Erosion control fabric shall be fastened at intervals no more than 3 feet apart in three rows for each strip, with one row along each edge and one row alternately spaced in the middle. All ends of the erosion control fabric shall be fastened at 24-inch intervals across their widths. The length of fastening devices shall be sufficient to securely anchor the erosion control fabric against the soil, and the fastening devices shall be driven flush with the finished grade.

**3.05 INSPECTION**

- A. The Contractor shall notify the Owner's Representative at least 48 hours in advance of the time of inspection required for completion of soil preparation before the planting of trees, shrubs, and groundcover can occur.

**END OF SECTION**

**SECTION 32 92 00**  
**HYDROSEEDING**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. Furnish all materials, equipment, and labor necessary for preparation, seeding, fertilizing, mulching, and protection of hydroseeded areas including the following:
  - 1. Fertilizer
  - 2. Hydromulch
  - 3. Soil binding agent
  - 4. Seed for stormwater conveyance areas
  - 5. Seed areas

**1.02 SUBMITTALS**

- A. Submit product data for fertilizers and hydromulch components. Submit seed vendor's certification for required grass seed mixture, indicating percentage by weight and percentages of purity, rumination, and weed seed for each grass species.

**1.03 QUALITY ASSURANCE**

- A. Seed shall be furnished in containers that show the following information: seed name, lot number, net weight, percentage of purity, germination, weed seed, and inert material. Seed that has become wet, moldy, or otherwise damaged will not be accepted. Seed shall conform to the requirements of the Washington State Seed Law and, when applicable, the Federal Seed Act and shall be "certified" grade or better.

**1.04 FIELD QUALITY CONTROL**

- A. Grading Inspection
  - 1. Rough grading shall be inspected and approved by the Owner's Representative prior to placement of soil amendments.
  - 2. Finish grading shall be inspected and approved by the Owner's Representative prior to seed application.
  - 3. Inspections:
  - 4. The Contractor shall request a provisional inspection upon completion of the Work. Upon completion of the punchlist, the Owner will make provisional acceptance of the Work in writing.

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5. Final acceptance will be at the end of the 1-year guarantee period and after all required repairs have been made.

#### 1.05 GUARANTEE AND REPLACEMENT

- A. Hydroseeding is guaranteed as specified in the Specifications. Seeded areas must have a uniform stand of grass defined as uniform, vigorous, growth with no bare spots over 6 square inches at the time of provisional acceptance. The Contractor shall reseed at the original rate and fertilize with 15-22-15 at the rate of 1 pound of nitrogen per 1,000 square feet. All areas failing to vigorously establish for any reason whatsoever within 90 days after germination or a growing season, whichever is longest, shall be reseeded.

### PART 2 – PRODUCTS

#### 2.01 GENERAL

- A. The materials used in performing this Work shall conform to the material Specifications listed in this section.

#### 2.02 FERTILIZER

- A. Finely ground dolomitic lime shall be retained by Taylor Standard Sieves as follows:
1. Number 20 sieve – retains 0.0%
  2. Number 100 sieve – retains 25%

- B. Lawn Seed installation fertilizer shall be approved by the Owner's Representative .

1. Guaranteed Fertilizer Analysis:
- |  |       |
|--|-------|
| Total Nitrogen (N)                       | 15%   |
| Ammoniacal Nitrogen                      | 4.6%  |
| Urea Nitrogen                            | 3.2%  |
| Coated Slow Release Urea Nitrogen        | 3.3%  |
| Slowly Available Water Soluble Nitrogen* | 2.3%  |
| Water Insoluble Nitrogen                 | 1.6%  |
| Available Phosphoric Acid (P205)         | 22%   |
| Soluble Potash (K20)                     | 15%   |
| Sulfur (S)                               | 4%    |
| Boron (B)                                | 0.06% |
| Copper (Cu)                              | 0.06% |
| Iron (Fe)                                | 1%    |
| Manganese (Mn)                           | 0.15% |
| Zinc (Zn)                                | 0.14% |

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Note: Derived from Urea, Sulfur-Coated Urea, Methylene Ureas, Ammonium Phosphate, Sulfate of Potash, Muriate of Potash, Iron Sulfate, Calcium and Sodium Borate, Copper Oxide and Sulfate, Iron Oxide Sulfate and Frit, Manganese Oxide and Sulfate, and Zinc Oxide and Sulfate.

\* Slowly Available Water Soluble Nitrogen from Methylene Ureas

### **2.03 HYDROMULCH**

- A. Mulch shall be wood cellulose fiber from alder, containing no growth- or germination-inhibiting substances. A soil-binding agent (tackifier) is required. Mulch shall be dyed a suitable color to facilitate placement coverage observation. Wood cellulose fiber carrier shall consist of pure wood fiber products with tackifier, and shall be:
  - 1. Conwed Fibers Hydro Mulch 2000, or approved equal.

### **2.04 SOIL BINDING AGENT (TACKIFIER)**

- A. Soil-binding agent shall consist of non-toxic, biodegradable materials that are environmentally safe, such as Hydrostraw Guar Plus ESI – TAK or approved equivalent. Tackifier shall be guar-based and shall be applied, at a minimum, in quantities sufficient to equal the retention properties of guar gum when applied at a rate of 60 gallons per ton of mulch.

### **2.05 SEED FOR STORMWATER CONVEYANCE AREAS**

- A. Seed shall meet the requirements of Section 9-14.3 of the WSDOT Standard Specifications. Seed shall be packed in clean, sound containers of uniform weight.
- B. Upon request, the Contractor shall furnish to the Owner's Representative duplicate copies of a statement signed by the vendor certifying that each lot of seed has been tested by a recognized seed-testing laboratory. Seed that has become wet, moldy, or otherwise damaged in transit or storage will not be accepted.
- C. Hydroseed for Stormwater Conveyance Areas:
  - 1. Seed Mix shall be composed of the following species, by weight:
    - a. 75-80% Tall or Meadow Fescue
    - b. 10-15% Seaside/Colonia Bentgrass
    - c. 5-10% Redtop
  - 2. Seed Mix shall also meet or exceed the following:
    - a. Minimum pure seed percent 98%
    - b. Minimum germination percent 90%
    - c. Maximum weed seed percent 0.5%

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**2.06 SEED AREAS**

- A. Seed shall meet the requirements of Section 9-14.3 of the WSDOT Standard Specifications. Seed shall be packed in clean, sound containers of uniform weight.
- B. Upon request, the Contractor shall furnish to the Owner's Representative duplicate copies of a statement signed by the vendor certifying that each lot of seed has been tested by a recognized seed-testing laboratory. Seed that has become wet, moldy, or otherwise damaged in transit or storage will not be accepted.

- C. Hydroseed for Lawn Restoration Areas:

- 1. Seed Mix shall be composed of the following species, by weight:
  - a. 50% Turf-type Perennial Rye-grasses
  - b. 25% Creeping Red Fescue
  - c. 25% Chewings Fescue
- 2. Seed Mix shall also meet or exceed the following:
  - a. Minimum pure seed percent 98%
  - b. Minimum germination percent 90%
  - c. Maximum weed seed percent 0.5%
- 3. Approved Grass Seed Varieties:
  - a. Turf-Type Perennial Rye Grass Blend:
    - 1) Grass Seed Blend must consist of at least two varieties listed below and mixed in equal portions, by weight:

Brightstar	Palmer II	Nighthawk	Prelude II
SR 4200	Prizm	Affinity	Assure
Dimension	APM	Charger	Sherwood
Blazer II	Stallion Sel	Tara	Commander
Saturn	SR 4100	Fiesta II	Birdie II

- b. Creeping Red Fescue: A single variety must be selected from the following list:
      - 1) Cindy
      - 2) Ensylva
      - 3) Flyer
      - 4) Salem
      - 5) Jasper
    - c. Chewings Fescue: A single variety must be selected from the following list:
      - 1) Longfellow
      - 2) Promoter
      - 3) Victory
      - 4) Weekend



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**PART 3 – EXECUTION**

**3.01 SITE PREPARATION**

- A. The Contractor shall notify the Owner's Representative no less than 48 hours in advance of any seeding operation and shall not begin the Work until areas prepared for seeding have been approved. Following the Owner's approval, seeding of the approved areas shall begin immediately. All soil preparation operations, compaction, and cleanup of debris shall be done prior to seeding and shall be approved by the Owner's Representative .

**3.02 SEEDING SCHEDULE**

- A. The time period for seeding shall be March 15 to September 15. No seeding shall be done before or after these dates without Owner's Representative written approval. No seeding shall take place on weekends or legal holidays.

**3.03 WATERING**

- A. The irrigation system must be installed prior to hydroseed application and shall not be removed until the Contractor's warrantee expires.

**3.04 SEEDING**

- A. Hydroseeding:
  - 1. Fertilizer, seed, and mulch shall be applied in one operation with approved hydraulic equipment. The Contractor shall apply materials at the following rates:
    - a. Mulch – 50 pounds per 1,000 square feet
  - 2. Seed – 8 pounds per 1,000 square feet
  - 3. Lawn Installation Fertilizer – 15-22-15, 10 pounds per 1,000 square feet in Lawn Areas only
  - 4. Soil-Binding Agent – 1 pound per 1,000 square feet in Erosion Control Areas only
  - 5. Seeding shall not be done during windy weather or when the ground is frozen.
  - 6. The Owner's Representative shall approve the Contractor's proposed watering methods prior to seeding.
  - 7. The Contractor shall give the Owner's Representative 48 hours' notice prior to seeding operation. Equipment shall utilize water as carrying agent, utilizing continuous built-in agitation system.
  - 8. Equipment with a gear pump is not acceptable.
  - 9. The Contractor shall pump a continuous, non-fluctuating supply of homogenous slurry to provide a uniform distribution of material over designated areas.

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**3.05 MAINTENANCE**

- A. The Contractor shall maintain seeded areas until grass is well established, exhibits a vigorous growing condition and until acceptance by the Owner's Representative. The plant establishment period shall begin when the planting and construction has been completed and accepted by the Owner's Representative and shall be for a period of 365 calendar days. The contractor shall submit to the Owner's Representative for approval a Plant Establishment Monthly Maintenance Schedule, itemizing the maintenance work to be performed during each month for the 365-day period.
- B. Maintenance shall include protection, weeding, mowing, and watering.
- C. Mowing Lawn Area and fertilizing: When grass reaches 3 inches in height, turf shall be mowed to 2.5 inches in height and fertilized with 25-5-15 at the rate of 1 pound of nitrogen per 1,000 square feet.

**3.06 PHYSICAL COMPLETION**

- A. Inspection to determine physical completion of seeded areas will be made by the Owner's Representative upon the Contractor's notification of completion. The Contractor may request a specific inspection date provided that the request is made at least 5 working days before the requested inspection date.
  - 1. Seeded areas will be accepted, provided all requirements, including maintenance, have been complied with and grass is well established and exhibits a vigorous growing condition.
  - 2. Areas failing to show a uniform stand of grass shall be reseeded at the Contractor's expense.
- B. Upon physical completion, the Owner will assume lawn maintenance duties.

**3.07 CLEANING**

- A. The Contractor shall perform cleaning during installation of the Work and upon completion of the Work. The Contractor shall remove from the site all excess materials, soil, debris, and equipment and shall repair the damage resulting from seeding operations.

**END OF SECTION**

**SECTION 32 93 00**  
**PLANTING**

**PART 1 – GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. Provide and plant trees, shrubs, and ground covers as shown and specified. The work includes the following:
  - 1. Plants and planting
  - 2. Mulch
  - 3. Maintenance until acceptance

**1.02 QUALITY ASSURANCE**

- A. Comply with sizing and grading standards of the latest edition of "American Standard for Nursery Stock."
- B. Nomenclature shall conform to Hortus Third compiled by the L. H. Bailey Arboretum, Cornell University, 1976.
- C. All plants shall be nursery grown or collected materials that has been held in a nursery for at least 1 year. Nursery climatic conditions must be similar to those in the locality of the project. All plants shall be weed free at the time of planting.
- D. Stock furnished shall be at least the minimum size indicated. Larger stock is acceptable at no additional cost, and providing that the larger plants will not be cut back to size indicated. Provide plants indicated by two measurements so that only a maximum of 25% are of the minimum size indicated and 75% are of the maximum size indicated.

**1.03 RELATED SECTIONS**

- A. Related sections include the following:
  - 1. Section 32 91 13—Soil Preparation and Erosion Control Fabrics

**1.04 SUBMITTALS**

- A. Plant nursery sources and photographs:
  - 1. Contractor shall submit a list of nurseries supplying all plant species shown on the Drawings. Submit representative color, dated photographs of each plant species.
- B. Submit the following material samples:

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- 1. Mulch submittal: Contractor shall notify the Owner's Representative of the source of supply and provide a 1-gallon sample for approval before installation.
  - C. Submit the following material certification/data sheets:
    - 1. Plant material sources including names and photographs of representative plant species.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Dig, pack, transport, and handle plants with care to ensure protection against injury. Inspection certificates required by law shall accompany each shipment invoice or order to stock. On arrival, the certificate shall be filed with the Owner's Representative. Protect all plants from desiccation. Wilt-proof or another antidessicant shall be applied only with approval of the Owner's Representative. If plants cannot be planted immediately upon delivery, properly protect them with soil, wet peat moss, or in a manner acceptable to the Owner's Representative. Water heeled-in plantings daily. No plant shall be bound with rope or wire in a manner that could damage or break the branches.
- B. Cover plants transported on open vehicles with a protective covering to prevent wind-burn.
- C. Provide dry, loose soils for planting. Frozen or muddy soil is not acceptable.
- D. Stock shall be handled by root ball only, not the trunks, stems, or tops.

**1.06 PROJECT CONDITIONS**

- A. Work notification: notify the Owner's Representative at least 5 working days prior to the installation of plant material.
- B. Protect existing utilities, paving, and other facilities from damage caused by planting operations.
- C. Do not install plant material when ambient temperatures may drop below 35°F or rise above 80°F.
- D. Do not install plants when wind velocity exceeds 30 miles per hour.
- E. Confine work to designated areas. Do not disturb existing vegetation outside project limits and protect all trees, shrubs and ground covers within project limits not designated to be removed. Do not permit vehicular traffic or materials storage under or around new or existing trees.

**1.07 SEQUENCING AND SCHEDULING**

- A. Planting vegetation shall be performed during the period between October 1 and April 30. Planting at other times shall only be done by written permission by the Owner's

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Representative and only if an irrigation system is available at the site at the time of planting.

#### **1.08 WARRANTY**

- A. Warrant plant material to remain alive and be in healthy, vigorous condition for a period of 1 year after the date of Physical Completion. Inspection of plants will be made by the Owner's Representative at the completion of planting.
- B. Replace, in accordance with the Drawings and Specifications, all plants that are dead or, as determined by the Owner's Representative, are in an unhealthy or unsightly condition, and have lost their natural shape due to dead branches, or other causes due to the Contractor's negligence. The cost of such replacement(s) is at the Contractor's expense. Warrant all replacement plants for 1 year after Physical Completion or installation, whichever is longer.
- C. Warranty shall not include damage or loss of trees, plants, or ground covers caused by fires, floods, freezing rains, lightning storms, or winds over 75 miles per hour, winter kill caused by extreme cold and severe winter conditions not typical of planting area, acts of vandalism, or negligence on the part of the Owner.
- D. Remove and immediately replace all plants, as determined by the Owner's Representative, to be unsatisfactory during the initial planting installation.
- E. This warranty also applies to existing trees, shrubs, and ground covers that are to be removed and heeled-in for later replanting on site.

### **PART 2 – PRODUCTS**

#### **2.01 PLANT MATERIALS**

- A. Plants: Provide plants typical of their species or variety, with normal, densely developed branches and vigorous, fibrous root systems. Provide only sound, healthy, vigorous plants free from weeds, defects, disfiguring knots, sunscald injuries, and abrasions of the bark, plant diseases, insect eggs, borers, and all forms of infestation. All plants shall have a fully developed form without voids, open spaces, broken branches, flush cuts, or stubs.
  - 1. Dig balled and burlapped plants with firm, natural balls of earth of sufficient diameter and depth to encompass the fibrous and absorbing root system necessary for full recovery of the plant. Provide ball sizes complying with the latest edition of the "American Standard for Nursery Stock." Cracked or mushroomed balls are not acceptable.
  - 2. Bare-root plants: Dug with adequate fibrous roots, covered with a uniformly thick coating of mud by being puddled immediately after they are dug, or packed in moist straw, sawdust or peat moss.
  - 3. Container-grown stock (including plugs): Grown in a container for sufficient length of time for the root system to have developed to hold its soil together, firm and whole.

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4. No plants shall be loose in the container.
  5. Container stock shall not be pot bound.
  6. No pruning wounds shall be present with a diameter of more than 0.5 inch and such wounds must show vigorous callous on all edges. Trees shall not be pruned within 6 months prior to delivery.
  7. Deciduous trees that have solitary leaders shall have only the lateral branches thinned by pruning. All conifer trees shall have only one leader (growing apex) and one terminal bud and shall not be sheared or shaped. Trees having a damaged or missing leader, multiple leaders, or Y-crotches will be rejected.

## **2.02 SOIL CONDITIONER**

- A. Soil conditioner shall consist of Mycor Tree Saver mycorrhizal fungal transplant inoculant for trees and shrubs or approved equal consisting of the following:

Ectomycorrhizal fungi	95 million spores/lb
Vesicular arbuscular mycorrhizal (VAM) fungi	5,300 spores /lb
Rhizosphere bacillus	324 million cfu/lb
Potassium polyacrylamide	33%
Formononetin	0.007%
Microbial nutrients	39.4%
Inert ingredients	27.3%

## **2.03 MULCH**

- A. General: Free from weeds, weed seed, mold or other noxious materials.
- B. Organic Mulch: Fine shredded fir or hemlock of uniform color for plant beds and around new trees in lawn areas shall be free from weed seed, sawdust, and splinters and shall not contain resin, tannin, wood fiber, or other compounds detrimental to plant life. Mulch produced from finished wood products or construction debris will not be allowed.
- C. Bagged mulch shall have moisture content not in excess of 22%.
- D. Bulk mulch shall have a size range of 0.5 to 1.25 inch with a maximum of 20% passing a 0.5-inch screen. Submit sample for approval.

## **PART 3 – EXECUTION**

### **3.01 INSPECTION**

- A. Finish grading shall be inspected and approved by the Owner's Representative prior to planting.

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- B. Plant material shall be inspected and approved by the Consultant and the Owner's Representative at the nursery or site prior to installation. Remove unsatisfactory material from the site immediately.

### **3.02 PREPARATION AND SEQUENCING**

- A. The Contractor shall locate plants by staking with stakes and flags as indicated on the Drawings or as approved in the field. If obstructions are encountered that are not shown on the Drawings, do not proceed until Owner's Representative has selected alternate plant locations.
- B. Plant materials shall be installed after log edging, topsoil, erosion control fabric, and irrigation have been installed and approved by the Owner's Representative .

### **3.03 PLANT INSTALLATION**

- A. Plants brought to the planting site shall be bare root, balled, and burlapped, or in containers, depending on how specified in the planting schedule in the Contract for the particular type of planting material. Plants shall not be planted during freezing weather or when the ground is frozen. Plants shall not be planted during excessively wet conditions. Plants shall not be placed on any day in which temperatures are forecast to exceed 80°F unless the Owner's Representative approves otherwise. Plants shall not be placed in areas that are below finished grade.
- B. Plants shall be removed from containers in a manner that prevents damage to the root system. Containers may require vertical cuts down the full depth of the container to accommodate removal. All circling roots shall be loosened to ensure natural directional growth after planting.
- C. Excavate circular plant pits with scarified vertical sides, except for plants specifically indicated to be planted in beds. Provide planting pits at least twice the diameter of the root system or container. Depth of pit shall accommodate the entire root system. Scarify the bottom and sides of the pit to a depth of 4 inches. If groundwater is encountered upon excavation of planting holes, the Contractor shall promptly notify the Owner.
- D. Place specified planting soil for use around the balls and roots of the plants.
- E. Set plant material in the planting pit to proper grade and alignment. Set plants upright, plumb, and faced to give the best appearance or relationship to each other or adjacent structure. Set crown of plant material at the finish grade. No filling will be permitted around trunks or stems or above grafts on grafted trees. Backfill the planting pit with specified soil or amendment. Do not use frozen or muddy mixtures for backfilling. Form a ring of soil around the edge of each planting pit to retain water.
- F. After balled and burlapped plants are set, water in soil mixture around bases of balls and fill all voids.

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- 1. Remove all burlap, or plastic wrapping materials, twine, and wires, and wire baskets from root balls.
  - 2. If burlap has been chemically treated (green color), remove from the planting pit.
  - G. Stake trees as indicated on the Drawings.
  - H. Space shrubs and ground cover plants using triangular spacing in accordance with indicated dimensions. Adjust spacing as necessary to evenly fill planting bed with indicated quantity of plants. Plant to within 18 inches of the trunks of trees and shrubs within planting bed and to within 12 inches of edge of bed.
  - I. Mulching:
    - 1. Mulch tree and shrub planting pits and shrub beds with required mulching material immediately after planting. Thoroughly water mulched areas. After watering, rake mulch to provide a uniform finished surface.
    - 2. Mulch ground cover beds immediately after planting.
  - J. Pruning: Prune all trees only to remove broken or damaged branches, or for aesthetic purposes as directed by the Owner. Branches will be pruned at the branch collar. Neither stubs nor flush cuts will be acceptable.

### **3.04 MAINTENANCE**

- A. Maintain planting until acceptance by the Owner's Representative. The plant establishment period shall begin when the planting and construction has been completed and accepted by the Owner's Representative and shall be for a period of 365 calendar days. The contractor shall submit to the Owner's Representative for approval a Plant Establishment Monthly Maintenance Schedule, itemizing the maintenance work to be performed during each month for the 365-day period.
- B. Maintenance shall include cultivating, weeding, watering, pruning (only as directed), and application of appropriate insecticides and fungicides necessary to maintain plants free of insects and disease.
  - 1. Reset settled plants to proper grade and position. Restore planting saucer and adjacent material and remove dead material.
  - 2. Straighten, repair and adjust guy wires and stakes as required.
  - 3. Correct defective work as soon as possible after deficiencies become apparent and weather and season permit.
  - 4. Water trees, shrub, and ground cover beds within the first 24 hours of initial planting, and not less than twice per week (including rain) until Physical Completion.
- C. At the end of each month during the plant establishment period, the Contractor shall submit to the Owner's Representative a Plant Establishment Monthly Statement of Maintenance form itemizing the maintenance work performed during the month. The list



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shall include a detailed account of the type of maintenance work performed, on what date, the materials used, and shall call to the attention of the Owner's Representative any existing condition that may require special consideration or treatment.

**3.05 PHYSICAL COMPLETION**

- A. Inspection to determine Physical Completion of planted areas will be made by the Owner's Representative, upon Contractor's request. Provide notification at least 10 working days before requested inspection date.
  - 1. Planted areas will be accepted provided all requirements, including the maintenance period, have been complied with and plant materials are alive and in a healthy, vigorous condition.
- B. Upon Physical Completion, the Owner will assume plant maintenance.

**3.06 CLEANING**

- A. Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess materials, soil, debris, and equipment. Repair damage resulting from planting operations.

**END OF SECTION**

**SECTION 32 93 10  
TREE AND SHRUB PROTECTION**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. Work described in 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 REFERENCES**

- A. For additional information on tree protection requirements, see the Luther Burbank Park Waterfront Improvements Tree Report provided in the Appendix to the specifications. Special tree protection instructions for one green ash (*Fraxinus pennsylvanica*) tree are listed in this report.
- B. Tree protection shall conform to the City of Mercer Island Municipal Code and the Tree Protection Area (TPZ) detail in the plans.
- C. Any discrepancies between the guidelines, requirements, and Drawings shall be brought to the attention of the Owner's Representative.

**PART 2 – PRODUCTS**

**2.01 TEMPORARY TREE PROTECTION FENCING**

- A. Temporary tree protection fencing shall be provided, as indicated on the Drawings, where Work will occur near the tree driplines and shall include the following:
  - 1. Temporary chain-link fencing materials, including posts, rails, braces, and mesh; the fence shall be 6 feet in height.
  - 2. Posts and rails shall be steel pipe with a minimum of 1- to 1/2-inch outside diameter.
  - 3. Mesh shall be 2 by 2 inches by 11-gauge minimum woven chain-link fabric.
  - 4. Post bases shall be a minimum of 16- by 8- by 8-inch-high concrete blocks with sleeves for posts, or approved equal.

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**PART 3 – EXECUTION**

**3.01 TEMPORARY TREE PROTECTION FENCING**

- A. Placement of temporary tree protection shall precede any other site work, including clearing and demolition.
- B. Temporary tree protection shall be inspected and approved by the Owner's Representative prior to any other site work, including mobilization and demolition.
- C. Temporary tree protection fencing may not be moved for any reason without prior approval from the Owner's Representative.

**3.02 PROTECTION WITHIN THE DRIPLINE**

- A. Where existing trees are within the area of Work or where existing trees outside the area of Work have driplines extending into the area of construction work, the Contractor shall employ the following methods to minimize adverse impact to these existing trees, including limbs, roots, and compaction of soil. The Contractor shall notify the Owner's Representative of any construction work within the dripline of trees at least 1 working day before the scheduled activity. These methods may include, but are not limited to, the following:
  - 1. Temporary chain-link construction-fencing installation
  - 2. Temporary tie-up of low limbs
  - 3. Application of a 5-inch-thick layer of coarse wood chips (wood chips from clearing and grubbing operations are acceptable) inside the tree protection fencing and two layers of 4- by 8-foot sheet 3/4-inch plywood or large steel construction plates within the dripline of trees
  - 4. Tree root pruning or other tree root treatment as directed by the Owner's Representative
- B. No storage of equipment or materials shall be allowed within the dripline of trees not designated for removal. Steel construction plates, or plywood sheeting as described previously, shall be used to support backhoe and other equipment stabilizers if it is necessary to set equipment within the dripline of a tree.

**3.03 ABOVE-GRADE WORK**

- A. When the Contractor anticipates construction operations will unavoidably affect tree limbs, the Contractor shall notify the Owner's Representative at least 5 working days in advance of commencing such operations.
  - 1. Before trimming any trees, the Contractor shall notify the Owner's Representative of the proposed method and amount of trimming required.

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2. Trimming shall be done in accordance with American National Standards Institute A300 Standards and performed by a Certified Arborist.

### **3.04 TRENCHING AND TUNNELING WITHIN THE DRIPLINE**

- A. Excavation or tunneling of any kind within the tree dripline will not be allowed unless the Contractor requests permission to do so at least 5 days in advance and receives approval from the Owner's Representative.
- B. Treatment of Roots: During excavation activities, if the Contractor encounters roots associated with trees to remain that are larger than 2 inches in diameter, the Contractor shall notify the Owner. The Owner may require a City Arborist to assess the tree roots and prescribe a method for removal or avoidance.
- C. Individual tree roots 2 inches or greater in diameter shall not be cut but, rather, protected when within the dripline of the tree.
- D. Tree roots smaller than 2 inches in diameter shall be cleanly cut flush with the edge of the trench or tunnel.
- E. Ripping or tearing of tree roots will not be allowed.

### **3.05 REPAIR, REPLACEMENT, AND PAYMENT FOR DAMAGE**

- A. Trees or other plant material not designated to be removed but that are destroyed or irreparably damaged by Contractor operations, as determined by the Owner's Representative, shall be repaired or replaced by the Contractor in accordance with the Owner's Representative's recommendations. Damage shall include unmitigated compaction of soil in the tree's critical root zone or other nonvisible damage that can be inferred by circumstantial evidence.
  1. Replacements shall be of the same species and, as nearly as possible, of the same size as the trees to be replaced.
  2. The Contractor shall allow 1 working day advance notice for inspection of nursery stock replacements by the Owner's Representative.
- B. Payment
  1. In addition to the Contractor's restoration approved by the Owner's Representative, the Contractor will be assessed damages for the difference in the dollar value of the damaged tree, shrub, or other plant material, as well as the dollar value of the replacement.
  2. The dollar value will be determined by the Owner's Representative from the *Guide for Plant Appraisal* (current edition), prepared by the Council of Tree and Landscape Appraisers. Damages assessed will be deducted from moneys due or that may become due to the Contractor.

**LUTHER BURBANK PARK WATERFRONT IMPROVEMENTS**  
**SECTION 32 93 10**  
**TREE AND SHRUB PROTECTION**

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- C. Planting of replacement stock shall be done in accordance with the requirements of the Contract Documents during the first fall or spring planting period, whichever comes first.

**END OF SECTION**

**SECTION 32 94 51**  
**SOIL CELL**

**PART 1 – GENERAL**

**1.01 SUMMARY OF WORK**

- A. Extent of Work: The extent of “Silva Cells” includes installation of a Silva Cell system for planting and paving. Silva Cells system includes arched structures and related accessories.

**1.02 REFERENCES**

**1.03 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Conference: Prior to installation of the Silva Cell system and associated Work, conduct conference to comply with requirements of 01 30 00 Administrative Requirements – 1.06 Preinstallation Conferences.
- B. Sequencing and Scheduling:
  - 1. General: Prior to beginning Work of this Section, prepare a detailed schedule of the Work involved for coordination with other trades.
  - 2. Schedule utility installations prior to beginning Work of this Section.
  - 3. Where possible, schedule the installation of the Silva Cell system after the area is no longer required for use by other trades and Work. Where necessary to prevent damage, protect installed system if Work must occur over or adjacent to the installed Silva Cell system.

**1.04 SUBMITTALS**

- A. Product data: For each type of product, submit manufacturer's product literature with technical data sufficient to demonstrate that the product meets these specifications.
- B. Manufacturer's Report: Submit the Silva Cell system manufacturer's letter of review and approval of the Project, including Drawings and Specifications, Addenda, Clarifications and Modifications, and for compliance with product installation requirements.
- C. Qualification Statements:
  - 1. Manufacturer:
  - 2. Submit list of completed projects demonstrating durability and longevity of in-place systems.
  - 3. Include project name, location, and date of completion.
  - 4. Installer:

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- 5. Submit documentation of the qualifications of the Silva Cell system installer and their field supervisor, sufficient to demonstrate that both meet the requirements specified in 1.05 QUALITY ASSURANCE.
  - 6. Submit a list of completed projects of similar scope and scale demonstrating capabilities and experience.
- D. Closeout Submittals: Submit these to the Design Professional at completion of installation.
- 1. Warranty: Submit manufacturer's warranty, fully executed.

### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications:
- 1. A manufacturer whose product is manufactured in an ISO/TS 16949 compliant and ISO 9001 - 2008 registered factory.
  - 2. A manufacturer with not less than 100 of the Silva Cell systems in-place, in the United States. Each system in use for not less than 7 years, confirming durability and longevity of the system.
  - 3. A manufacturer with documented written approval of their product for use as a stormwater treatment device by a minimum of 3 governmental jurisdictions.
  - 4. A manufacturer with an established and demonstrated utility service and repair process, including written procedure and photographs demonstrating work.
  - 5. A manufacturer with a published operating and maintenance manual
- B. Installer Qualifications: A qualified installer with not less than 5 years of successful experience installing the Silva Cell systems or related products and materials, and whose work has resulted in successful installation of underground piping, chambers and vault structures, planting soils, and planter drainage systems of a similar scope and scale in dense urban areas.
- C. Installer's Field Supervisor: A full-time supervisor employed by the installer with not less than 5 years of successful experience similar to that of the installer and present at the Project site when Work is in progress. Utilize the same field supervisor throughout the Project, unless a substitution is submitted to and approved in writing by the Design Professional.
- D. Mock-Up: Prior to the installation of the Silva Cell system, construct a mock-up of the complete installation at the Project site in the presence of the Design Professional.
- 1. Size and Extent: Minimum of 100 sq. ft. (10 sq. m.) in area and including the complete Silva Cell system installation with subbase, aggregate subbase, drainage installation, Silva Cell decks, posts, and bases, base course aggregate, geotextile, geogrid, backfill, planting soil, and necessary accessories.

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2. The mock-up area may remain as part of the installed Work at the end of the Project provided that it remains undamaged and meets the requirements of the Drawings and Specifications.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Silva Cell System: Protect the Silva Cell system components from damage during delivery, storage and handling.
  1. Store components on smooth surfaces, free from dirt, mud and debris. Store under tarp to protect from sunlight when time from delivery to installation exceeds one week.
  2. Perform handling with equipment appropriate to the size (height) of the Silva Cell units and site conditions; equipment may include hand, handcart, forklifts, extension lifts, or small cranes, with care given to minimize damage to Silva Cell bases, post assemblies, decks and adjacent assembled Silva Cell units.
- B. Packaged Materials: Deliver packaged materials in original, unopened containers indicating weight, certified analysis, name and address of manufacturer, and indication of conformance with State and Federal laws, if applicable. Protect materials from deterioration during delivery and while on the Project site.
  1. Do not deliver or place backfill, soils, or soil amendments in frozen, wet, or muddy conditions.
  2. Provide protection including tarps, plastic and/or matting between bulk materials and finished surfaces sufficient to protect the finish material.
  3. Bring planting soil to the site using equipment and methods that do not overly mix and further damage soil peds within the soil mix.

#### **1.07 FIELD CONDITIONS**

- A. Existing Conditions: Do not proceed with Work when subgrades, soils and planting soils are in a wet, muddy, or frozen condition.

### **PART 2 – PRODUCTS**

#### **2.01 MANUFACTURER**

- A. Acceptable Manufacturers:

USA - Head Office DeepRoot Green Infrastructure, LLC 1032 Irving Street, #614 San Francisco, CA 94122-220
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- B. Substitutions: Manufacturers seeking approval of their products are required to receive prior approval 7 days prior to bid opening.

## **2.02 DESCRIPTION**

- A. The term Silva Cell shall be used to refer to a single Silva Cell.
- B. Silva Cells shall be designed for the purpose of growing healthy trees and providing stormwater management.
- C. Silva Cells shall be modular, structural systems.
- D. Each Silva Cell shall be structurally-independent from all adjacent Silva Cells for incorporating utilities and other site features as well as for future repairs.
- E. Silva Cells shall be capable of supporting loads up to and including AASHTO H-20.
- F. Silva Cells shall be open on all vertical faces and horizontal planes and shall have no interior walls or diaphragms.
- G. Silva Cells shall be capable of providing a large, contiguous, continuous volume of planting soil that does not inhibit or prevent the following:
1. Placement of planting soil,
  2. Walk through compaction,
  3. Compaction testing of planting soil, once in place,
  4. Movement and growth of roots,
  5. Movement of water within the provided soil volume, including lateral capillary movement, or
  6. Installation and maintenance of utilities placed within, adjacent to, or below the Silva Cell.
- H. Silva Cells shall be capable of being filled with a variety of soil types and soils that include peds 2 inches (50 mm) or larger in diameter as is appropriate for the application, location of the installation, and tree species.

## **2.03 SILVA CELL MATERIALS AND ACCESSORIES**

- A. Silva Cell System Components: Each "Silva Cell" soil cell module (hereafter Silva Cell or "cell") is composed of one base, 6 post assemblies, and one deck.
1. Table 1 defines each Silva Cell System, including the system name, system dimensions (inches), and the number of base units, post units (post assembly), and deck units required to assemble one complete Silva Cell.

**TABLE 1: SILVA CELL SYSTEM ASSEMBLED DIMENSIONS AND COMPONENTS**

System + System Dimensions (Inches)				Base	Post Assembly			Deck
System Name	System Height	Base + Deck Length	Base + Deck Width	Base QTY	.5x Post QTY	1x Post QTY	2x Post QTY	Deck QTY
.5x	12.9	47.25	23.6	1	6			1
1x	16.7	47.25	23.6	1		6		1
1.5x	21.0	47.25	23.6	1	6	6		1
2x	30.9	47.25	23.6	1			6	1
2.5x	35.1	47.25	23.6	1	6		6	1
3x	43.0	47.25	23.6	1		6	6	1
3.5x	47.3	47.25	23.6	1	6	6	6	1
4x	57.2	47.25	23.6	1			12	1

- B. Silva Cell Materials and Fabrication:
  - 1. Bases and Posts: Homopolymer polypropylene.
  - 2. Decks: Fiberglass reinforced, chemically-coupled, impact modified polypropylene.
- C. Manufacturer's Related Silva Cell Installation Accessories:
  - 1. Strongbacks: An accessory designed to stabilize the Silva Cell posts temporarily, during soil placement, and removed for reuse prior to placing decks.
  - 2. Anchoring Spikes: 10" landscape spike for securing assembled Silva Cells to subbase.

## 2.04 RELATED PRODUCTS

- A. Root Barrier: Recyclable, black, injection molded panels manufactured with a minimum 50 percent post-consumer recycled polypropylene plastic with UV inhibitors, and integrated zipper joining system which allows instant assembly by sliding one panel into another; for redirecting tree roots down and away from hardscapes.
  - 1. Panel Sizes:
    - a. No. UB12-2: 24 inches long by 12 inches deep by 0.080 inches thick; for use with 1x systems and for pavement profiles less than 12 inches deep.
    - b. No. UB18-2: 24 inches long by 18 inches deep by 0.080 inches; for use with 2x and 3x systems, and for pavement profiles 12 inches or more in depth.
  - 2. Products meeting this specification:
    - a. DeepRoot Tree Root Barrier (DeepRoot Green Infrastructure, LLC)
- B. Geogrid: Net-shaped woven polyester fabric with PVC coating, uniaxial or biaxial geogrid, inert to biological degradation, resistant to naturally occurring chemicals, alkalis, and acids; used to provide a stabilizing force within soil structure as the fill interlocks with the grid.
  - 1. Tensile strength at ultimate (ASTM D6637):
    - a. 1850 lbs/ft (27.0 kN/m) minimum
  - 2. Creep reduced strength (ASTM D5262):

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- a. 1000 lbs/ft (14.6 kN/m) minimum
  - 3. Long term allowable design load (GRI GG-4):
    - a. 950 lbs/ft (13.9 kN/m) minimum
  - 4. Grid aperture size (MD):
    - a. 0.8 inch (20 mm) minimum
  - 5. Grid aperture size (CD):
    - a. 1.28 inch (32 mm) maximum
  - 6. Roll size: 6-foot (1.8-m) width is preferred, up to 18-foot (5.4-m).
  - 7. Products meeting this specification:
    - a. Stratagrid SG 150
    - b. Miragrid 2XT
    - c. Fortrac 35 Geogrid
    - d. SF 20 Biaxial Geogrid
- C. Geotextile – See Section 31 00 00 Earthwork.
- D. Plastic Cable Ties: A tensioning device or tool used to tie similar or different materials together with a specific degree of tension.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION**

- A. Examine the conditions under which the Silva Cells are to be installed.
  - 1. Carefully check and verify dimensions, quantities, and grade elevations.
  - 2. Carefully examine the Drawings to become familiar with the existing underground conditions before digging. Verify the location of aboveground and underground utility lines, infrastructure, other improvements, and existing trees, shrubs, and plants to remain including their root system.
  - 3. Notify the Contractor and the Design Professional in writing in the event of conflict between existing and new improvements, of discrepancies, and other conditions detrimental to proper and timely completion of the installation.
  - 4. Obtain written approval of changes to the Work prior to proceeding. Proceed with installation only after changes have been made and unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Take proper precautions as necessary to avoid damage to existing improvements and plantings.
- B. Prior to the start of Work, layout and stake the limits of excavation and horizontal and vertical control points sufficient to install the complete Silva Cell system.

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- C. Coordinate installation with other trades that may impact the completion of the Work.

### **3.03 TEMPORARY PROTECTION**

- A. Protect open excavations and Silva Cell system from access and damage both when Work is in progress and following completion, with highly visible construction tape, fencing, or other means until related construction is complete.
- B. Do not drive vehicles or operate equipment over the Silva Cell system until the final surface material has been installed.

### **3.04 EXCAVATION**

- A. General: Excavate to the depths and shapes indicated on the Drawings. Provide smooth and level excavation base free of lumps and debris.
- B. Confirm that the depth of the excavation is accurate and includes the full section of materials required to place the subbase aggregate, Silva Cells, and pavement profile as indicated on the Drawings.
- C. Over-excavate beyond the perimeter of the Silva Cell to allow for:
  - 1. The extension of aggregate subbase beyond the Silva Cell layout as shown on the Drawings.
  - 2. Adequate space for proper compaction of backfill around the Silva Cell system.
- D. If unsuitable subgrade soils are encountered, consult the Owner's geotechnical consultants for directions on how to proceed.
- E. If conflicts arise during excavation, notify the Design Professional in writing and make recommendations for action. Proceed with Work only when action is approved in writing.

### **3.05 SUBGRADE PREPARATION**

- A. Prepare subgrade as indicated in the drawings.
- B. Do not exceed 10% slope for subgrade profile in any one direction. If the 10% slope is exceeded, contact manufacturer's representative for directions on how to proceed.

### **3.06 INSTALLATION OF GEOTEXTILE OVER SUBGRADE**

- A. Install geotextile over compacted subgrade.
  - 1. Lay geotextile flat with no folds or creases.
  - 2. Install the geotextile with a minimum joint overlap of 18 inches (450 mm).

### **3.07 INSTALLATION OF AGGREGATE SUBBASE BELOW SILVA CELL BASES**

- A. Install aggregate subbase to the depths indicated on the Drawings.

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- B. Extend subbase aggregate a minimum of 6 inches beyond the base of the Silva Cell layout.
  - C. Compact aggregate subbase to a minimum of 95% of maximum dry density at optimum moisture content in accordance with ASTM D698.
  - D. Do not exceed 10% slope on the surface of the subbase. Where proposed grades are greater than 10%, step the Silva Cells to maintain proper relation to the finished grade.

### **3.08 INSTALLATION OF SILVA CELL BASE**

- A. Install the Silva Cell system in strict accordance with manufacturer's instructions and as specified herein; where requirements conflict or are contradictory, follow the more stringent requirements.
- B. Layout and Elevation Control:
  - 1. Provide layout and elevation control during installation of the Silva Cell system to ensure that layout and elevations are in accordance with the Drawings.
- C. Establish the location of the tree openings in accordance with the Drawings. Once the trees are located, mark the inside dimensions of the tree openings on the prepared subbase.
- D. Locate and mark other Project features located within the Silva Cell layout (e.g. light pole bases, utility pipes). Apply marking to identify the extent of the Silva Cell layout around these features. Follow the layout as shown on the Drawings to ensure proper spacing of the Silva Cell bases. Refer to the Drawings for offsets between these features and the Silva Cells.
- E. Check each Silva Cell component for damage prior to placement. Reject cracked or chipped units.
- F. Place the Silva Cell bases on the compacted aggregate subbase. Start at the tree opening and place Silva Cell bases around the tree openings as shown on the Drawings.
- G. Working from tree opening to tree opening, place Silva Cell bases to fill in the area between tree openings.
  - 1. Maintain spacing no less than 1 inch and no more than 6 inches apart
- H. Follow the Silva Cell layout plan as shown on the Drawings.
- I. Install Silva Cell bases around, over, or under existing or proposed utility lines, as indicated on the Drawings.
- J. Level each Silva Cell base as needed to provide full contact with subbase. Adjust subbase material, including larger pieces of aggregate, so each base sits solidly on the surface of the subbase. Silva Cell bases that rock or bend over any stone or other obstruction protruding above the surface of the subbase material are not allowed. Silva Cell bases which bend into dips in the subbase material are not allowed. The maximum tolerance for deviations in the plane of the subbase material under the bottom of the horizontal beams of each Silva Cell base is 1/4 inch in 4 feet.

- K. Anchor Silva Cell base with 2 anchoring spikes per base.
1. For applications where Silva Cells are installed over waterproofed structures, use wood blocking or similar spacing system consistent with requirements of the waterproofing system to maintain required spacing.

### **3.09 INSTALLATION OF SILVA CELL POST ASSEMBLIES**

- A. Silva Cell Post Assembly:
1. Attach posts to the installed Silva Cell base in the order shown in Table 2. Each base will receive 6 primary posts. Place the end of the primary post with tabs into the base. Rotate primary post clockwise to snap in place.
  2. Where post extensions are required to meet system height, install one layer of post extension at a time. Each post assembly will receive 6 post extensions per layer. Place the end of the post extension with tabs into the primary post or post extension. Rotate post extension clockwise to snap in place.
  3. Place all required strongbacks, geogrid, backfill, and planting soil for each layer of required post assembly, as described herein, before adding subsequent post extensions or decks.

**Table 2: Silva Cell Post Assemblies (Name, Quantity, and Installation Order)**

Post Assembly Installation Order and Quantity per Silva Cell			
Post Assembly Name	Primary Post	Post Extension 1	Post Extension 2
.5x	.5x - 6 Each		
1x	1x - 6 Each		
1.5x	1x - 6 Each	.5x - 6 Each	
2x	2x - 6 Each		
2.5x	2x - 6 Each	.5x - 6 Each	
3x	2x - 6 Each	1x - 6 Each	
3.5x	2x - 6 Each	.5x - 6 Each	1x - 6 Each
4x	2x - 6 Each	2x - 6 Each	

### **3.10 INSTALLATION OF STRONGBACKS, GEOGRID, BACKFILL AND PLANTING SOIL**

- A. For Silva Cell systems that have a perforated drain line located inside or adjacent to the system, consult Drawings for layout and details for requirements.
- B. Following the placement of primary posts, place strongbacks by snapping into place over installed posts prior to installing planting soil and backfill.
1. Strongbacks are only required during the placement and compaction of the planting soil and backfill.
  2. Move strongbacks as the Work progresses across the installation.
  3. Remove strongbacks prior to the installation of the Silva Cell decks.

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- C. Install geogrid around the perimeter of the Silva Cell system where the compacted backfill and planting soil interface.
    - 1. Do not place geogrid between the edge of the Silva Cells and adjacent planting areas.
    - 2. Cut the geogrid to allow for a 6-inch overlap at the Silva Cell base and a 12-inch overlap at the Silva Cell deck.
    - 3. Provide a minimum 12-inch overlap between adjacent sheets of geogrid.
    - 4. Secure geogrid with cable ties below the top of the posts, along the post ridges.
  - D. Place the first lift of backfill material loosely around the perimeter of the Silva Cell system, between the geogrid and the sides of the excavation. Place backfill to approximately the midpoint of the Silva Cell post. Do not compact.
  - E. Place the first lift of planting soil in the Silva Cell system to approximately the midpoint of the Silva Cell post.
    - 1. Level the planting soil throughout the system.
    - 2. Walk-through the placed planting soil to remove air pockets and settle the soil.
      - a. Lightly compact soils by walking through the soil following placement.
    - 3. Walk-through compaction shall result in 75% to 85% of maximum dry density at optimum moisture content in accordance with BS 1344 Part 4. Do not exceed root limiting compaction for the given soil type.
  - F. Compact the first lift of backfill material, previously spread, to 95% of maximum dry density at optimum moisture content in accordance with BS 1344 Part 4.
  - G. Add and compact additional backfill material so that the final finished elevation is at approximately the same level of the placed planting soil within the Silva Cells.
    - 1. Maintain the geogrid between the Silva Cell system and the backfill material at all times.
  - H. Place the second lift of backfill material loosely around the perimeter of the Silva Cell system, between the geogrid and the sides of the excavation so that the material is 2 to 3 inches below the top of the posts. Do not compact.
  - I. Place the second lift of planting soil inside of the Silva Cell to the bottom of the strongbacks. Walk through compact.
  - J. Remove strongbacks. Place the first or final post extension into the primary post. Rotate clockwise to snap in place.
  - K. Immediately reinstall strongbacks on top of the post assembly.
  - L. Repeat the process of adding post extensions, planting soil, and backfill, as described herein, until the requirements of the drawings and Table 2 are met. Alternately place backfill and planting soil so that elevation of the compacted backfill and the walked-through compacted planting soil are just below the level of the strongbacks at each

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required post extension and when the full post assembly is installed per the drawings and Table 2.

### **3.11 INSTALLATION OF SILVA CELL DECK**

- A. Obtain final approval by the Engineer of planting soil installation prior to installation of the Silva Cell decks.
- B. Remove strongbacks, level out the planting soil, and immediately install decks over the post assemblies below. Place deck over the top of the post assemblies. Push decks down until the deck clips lock into the posts, snapping the deck into place.
- C. Fold the 12 inches of geogrid onto the top of the decks.

### **3.12 FINAL BACKFILL PLACEMENT AND COMPACTION**

- A. Place and compact final lift of backfill material to 95% of maximum dry density in accordance with ASTM D698, such that the backfill is flush with the top of the installed deck. Do not allow compacting equipment to come in contact with the decks.

### **3.13 INSTALLATION OF GEOTEXTILE AND AGGREGATE BASE COURSE OVER THE DECK**

- A. Place geotextile over the top of the deck and extend to the edge of the excavation. Overlap joints a minimum of 18 inches. Leave enough slack in the geotextile for the aggregate base course to push the geotextile down in the gaps in between the decks.
- B. Install the aggregate base course (including aggregate setting bed if installing unit pavers) over the geotextile immediately after completing the installation of the fabrics. Work the aggregate from one side of the layout to the other so that the fabric and aggregate conform to the Silva Cell deck contours.
- C. Maintain equipment used to place aggregate base course completely outside the limits of the Silva Cell excavation area to prevent damage to the installed system.
- D. For large or confined areas, where aggregate cannot easily be placed from the edges of the excavated area, obtain approval for the installation procedure and types of equipment to be used in the installation from the Silva Cell manufacturer.
- E. Compact aggregate base course(s) to 95 percent of maximum dry density in accordance with ASTM D698. Utilize a vibration or plate compactor with a maximum weight of 800 lbs.
- F. Do not drive vehicles or operate equipment over the completed aggregate base course.

### **3.14 INSTALLATION OF CONCRETE CURBS AT TREE OPENINGS, AGGREGATE SUBBASE AND PAVEMENT ABOVE THE SILVA CELL SYSTEM**

- A. Place concrete curbs along planting areas and tree openings as shown on the Drawings to retain the aggregate base course from migrating into the planting soil.



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- B. When staking concrete forms (e.g. curbs around the tree openings), prevent stakes from penetrating the Silva Cell decks.
  - C. Turn down edge of concrete paving to the Silva Cell deck along the edges of tree openings or planting areas to retain the aggregate base course material.
  - D. When paving type is a unit paver or other flexible material, provide a concrete curb under the paving at the edge of the Silva Cell deck to retain the aggregate base course material at the tree opening.
  - E. Place paving material over Silva Cell system in accordance with the Drawings.
    - 1. The Silva Cell system does not fully meet loading strength until the final paving is installed. Do not operate construction equipment on top of the Silva Cell system until paving installation has been completed.
  - F. Use care when placing paving or other backfill on top of Silva Cell system to prevent damage to the Silva Cell system or its components.

### **3.15 INSTALLATION OF ROOT BARRIERS**

- A. Install root barrier in accordance with manufacturer's installation instructions.

### **3.16 INSTALLATION OF PLANTING SOIL WITHIN THE TREE PLANTING AREA**

- A. Remove rubble, debris, dust and silt from the top of the planting soil within the tree opening that may have accumulated after the initial installation of the planting soil within the Silva Cells.
- B. Install additional planting soil within the tree openings, to the depths indicated on the Drawings.
  - 1. Use the same soil used within the Silva Cells for planting soil within the tree openings.
- C. Compact planting soil under the tree root ball as needed to prevent settlement of the root ball.
- D. Place tree(s) in accordance with the Drawings.

### **3.17 PROTECTION**

- A. Keep construction traffic away from the limits of the Silva Cells until the final pavement profile is in place. The Silva Cell system does not fully meet loading strength until the final paving is installed.
  - 1. Do not operate equipment directly on top of the Silva Cell system until paving installation has been completed.

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2. Provide fencing and other barriers to prevent vehicles from entering into the Silva Cell area.

B. When the Silva Cell installation is completed and the permanent pavement is in place, limit traffic and construction related activities to only loads less than the design loads.

### **3.18 CLEAN UP**

A. Perform clean up during installation and upon completion of the Work. Maintain the site free of soil, sediment, trash and debris. Remove excess soil materials, debris, and equipment from the site following completion of the Work of this Section.

B. Repair damage to adjacent materials and surfaces resulting from installation of this Work using mechanics skilled in remedial work of the construction type and trades affected.

**END OF SECTION**

**SECTION 32 94 56**  
**PLANTING SOIL FOR SOIL CELLS**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. Section Includes:
  - 1. Labor, materials, tools, supplies, equipment, facilities, transportation and services necessary for, and incidental to performing all operations in connection with furnishing, and delivery of planting soil and /or the modification of existing site soil for use as planting soil within the Silva Cell system.
- B. The scope of Work in this Section includes, but is not limited to, the following:
  - 1. Locate, purchase, deliver and install imported planting soil and soil amendments.

**1.02 REFERENCES**

- A. Definitions:
  - 1. COMPACTION: The density of soil measured as oven dry weight divided by volume.
  - 2. EXISTING SOIL: Mineral soil existing at the locations of proposed planting of area designated for the installation of Silva Cells after the majority of the construction within and around the planting or Silva Cell site is completed and just prior to the start of Work to excavate the soil
  - 3. DESIGN PROFESSIONAL: The person or entity, employed by the Owner to represent their interest in the review of the Work.
  - 4. PED: Clump or clod of soil held together by a combination of clay, organic matter, and fungal hyphae, retaining the original structure of the harvested soil.
  - 5. SCREENED SOIL: Soil that has been processed through a metal screen to remove or break apart soil peds (clumps /clods), roots, rocks and debris and remove larger physical items in the soil not permitted by the specification.
  - 6. SILVA CELLS: Structural paving support system defined in Section **32 94 51** Soil Cell.
  - 7. SUBGRADE: Surface or elevation of subsoil remaining after completing excavation, or top surface of fill or backfill, before placing planting soil.
- B. Reference Standards:
  - 1. ASTM International (ASTM)
    - a. ASTM C33, Standard Specification for Concrete Aggregates- Fine Aggregates.
  - 2. The Soil Science Society of America.

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- a. Methods of Soil Analysis, most current edition,
  3. United States Composting Council [www.compostingcouncil.org](http://www.compostingcouncil.org) and  
[http://compostingcouncil.org/admin/wp-content/plugins/wp-pdfupload/pdf/191/LandscapeArch\\_Specs.pdf](http://compostingcouncil.org/admin/wp-content/plugins/wp-pdfupload/pdf/191/LandscapeArch_Specs.pdf).
  4. United States Department of Agriculture, Natural Resources Conservation Service
    - a. National Soil Survey Handbook, title 430-VI.  
[http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2\\_054242](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2_054242)

### 1.03 SUBMITTALS

- A. Action Submittals: Submit in accordance with Section **01 33 00 Submittals**:
- B. Action Submittals: Submit these to the Design Professional for review and acceptance not less than 45 days prior to start of installation of materials and products specified in this Section.
  1. Product Data: For each type of product, submit manufacturer's product literature with technical data sufficient to demonstrate that the product meets these specifications.
    - a. For each compost product submit the manufactures certification that the compost meets the requirements for US Compost Council STA/TMECC criteria for "Compost as a Landscape Backfill Mix Component" and other requirements of the Specification.
    - b. For coarse sand product submit the following analysis by a recognized laboratory:
      - 1) pH
      - 2) Manufactures Fines Modulus Index
      - 3) Particle size distribution (percent passing the following sieve sizes):

3/8 inch	(9.5 mm)
No 4	(4.75 mm)
No 8	(2.36 mm)
No 16	(1.18 mm)
No 30	(0.60 mm)
No 50	(0.30 mm)
No 100	(0.15 mm)
No 200	(0.075 mm)
  2. Test and Evaluation Reports:
    - a. Include analysis of bulk materials including soils and aggregates, by a recognized laboratory that demonstrates that the materials meet the Specification requirements.

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- b. Submit required soil test analysis report for each sample of imported topsoil, existing site soil, and planting soil mixes from an approved soil-testing laboratory as follows:
    - 1) Do not submit planting soil mixes, for testing until all topsoil, compost, and coarse sand have been approved.
    - 2) If tests fail to meet the Specifications, obtain other sources of material, retest and resubmit until accepted by the Design Professional.
    - 3) All testing shall be performed following the requirements of *Methods of Soil Analysis*, The Soil Science Society of America.
    - 4) Provide a particle size analysis (percent dry weight) and USDA soil texture analysis. Soil testing of planting soil mixes shall also include USDA gradation distribution of gravel, coarse sand, medium sand, and fine sand in addition to silt and clay. Reports of partial size distribution shall use USDA size nomenclature and analysis protocols.
    - 5) Provide the following other soil properties:
      - a) pH and buffer pH.
      - b) Percent organic content by oven dried weight.
      - c) Nutrient levels by parts per million including: phosphorus, potassium, magnesium, manganese, iron, zinc and calcium. Nutrient test shall include the testing laboratory recommendations for supplemental additions to the soil for optimum growth of the plantings specified.
      - d) Soluble salt by electrical conductivity of a 1:2 soil water sample measured in Milliohm per cm.
    - 6) All soil testing will be at the expense of the Contractor.
  - 3. Samples:
    - a. Each sample shall be double bagged packaged in two plastic zip loc style bags. Each bag shall be clearly marked with the project name, date, contractors name and telephone number, and product name.
    - b. Samples of all existing site soil, topsoil, coarse sand and, compost and planting soil mixes shall be submitted at the same time as the particle size and physical analysis of that material.
    - c. Samples of the existing site soil that are under existing pavement to be removed may be submitted as soon as possible after the paving is removed.
    - d. Samples will be reviewed for appearance only.
    - e. Provide samples for the following products.
      - 1) One-gallon (3.79-liter) sample of each type of existing site soil prior to adding amendments.
      - 2) One-gallon (3.79-liter) sample of imported topsoil.
      - 3) One-gallon (3.79-liter) sample of bio-retention topsoil.

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- 4) One-gallon (3.79-liter) sample of compost.
  - 5) One-gallon (3.79-liter) sample of bio-retention compost.
  - 6) One-gallon (3.79-liter) sample of coarse sand.
  - 7) One-gallon (3.79-liter) sample of unscreened planting soil mix.
  - 8) One-gallon (3.79-liter) sample of screened planting soil mix.
  - 9) One-gallon (3.79-liter) sample of bio-retention soil mix.
4. Qualification Statements:
- a. Soil supplier:
    - 1) Submit documentation of the qualifications of the planting soil supplier and their field supervisor, sufficient to demonstrate that both meet the requirements specified in Article 1.05 QUALITY ASSURANCE.
    - 2) Submit list of completed projects of similar scope and scale demonstrating capabilities and experience.

#### **1.04 QUALITY ASSURANCE**

- A. Supplier: Soil mixes shall be supplied by a firm that specializes in the production of mixes of planting soils and have at least 5 years experience in providing soil mixes soils to projects of similar size and scope to this Work.
- B. Soil Testing Laboratory Qualifications: The testing laboratory shall specialize in agricultural soil testing and be a member of the Soil Science Society of America's, North American Proficiency Testing Program (NAPT). Testing results for soil particle size shall be reported using USDA sizes for sand, silt, and clay.

#### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Weather: Do not mix or deliver soil when frozen or muddy.
- B. Protect soil and soil stockpiles, from wind, rain and washing that can erode soil or separate fines and coarse material, and contamination by chemicals, dust and debris that may be detrimental to plants or soil drainage. Confine delivered materials to neat piles in areas coordinated with the site supervisor. Cover stockpiles with plastic sheeting or fabric at the end of each Workday.
- C. All manufactured packaged products and material shall be delivered to the site in unopened containers and stored in a dry enclosed space suitable for the material and meeting all environmental regulations.
  - 1. Biological and chemical additives shall be protected from extreme humidity, cold, or heat. All products shall be freshly manufactured and dated for the year in which the products are to be used. Chemical amendments shall have original labels intact and legible, stating the guaranteed chemical analysis.

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## PART 2 – PRODUCTS

### 2.01 IMPORTED TOPSOIL

- A. Imported topsoil: Fertile, friable soil loam topsoil suitable for the germination of seeds and the support of vegetative growth meeting the following criteria:
1. Soil texture: USDA loam, sandy clay loam or sandy loam with clay content between 15 and 35 percent; a combined clay/silt content of no more than 60 percent; and sand between 35 and 65 percent.
  2. Except where noted, imported topsoil shall NOT have been screened and shall retain soil peds (clumps/clods) larger than 2 inches (50 mm) in diameter throughout the stockpile after harvesting.
    - a. Light screening through a 2-inch (50 mm) square or larger opening will be permissible in soils with clay content of 20 percent or greater if required to break up large peds (clumps/clods) or remove coarse roots and stones.
    - b. Retained soil peds (clumps/clods) shall be the same color on the inside as is visible on the outside surface of the ped.
  3. Soil objects larger than 1/4 inch (6.24 mm) in diameter: Imported topsoil shall contain less than 5 percent total volume of the combination of all objects 1 to 8 inch (25 mm to 200 mm) in their largest dimension including clumps/clods of heavy clay, sandy clay or silty clay subsoil, debris, refuse, roots, stones, sticks, brush, and or litter. The soil shall contain less than 8 percent by volume total of the above objects 1/4 inch to 1 inch (6.24 mm to 25 mm) in diameter. Remove all objects larger than 8 inch (200 mm) in its longest dimension.
    - a. Meet the above requirement by utilizing acceptable soils sources rather than soil screening.
  4. Imported topsoil may be a harvested soil from fields or development sites or purchased from suppliers who collect and process soil. The organic content and particle size distribution shall be the result of natural soil formation. Manufactured soils where sand, composted organic material or other additives have been added to the soil to meet the requirements of imported topsoil shall not be acceptable.
  5. pH value shall be between 5.5 and 7.5.
  6. Percent Organic Matter (OM): 3 to 5 percent, by dry weight.
  7. Soluble Salt Level: Less than 2 mmho/cm.
  8. Soil nutrient chemistry suitable for growing the plants specified or after modification.
  9. Germinating seedlings from seeds in the soil shall be removed within one month of germination whether during the period the soil is being stored or after installation, including during the warranty period of the plants.

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## 2.02 COMPOST

- A. Compost: Blended and ground leaf, wood and other plant based material, composted for a minimum of 9 months and at temperatures sufficient to break down woody fibers, seeds and leaf structures, free of toxic material at levels that are harmful to plants or humans. Compost feed stock shall be yard waste trimmings, blended with other plant and or manure feed stock designed to produce compost high in fungal material.
  - 1. Compost shall be commercially prepared compost and meet US Compost Council STA/TMECC criteria or as modified in this Section for "Compost as a Landscape Backfill Mix Component".  
[http://compostingcouncil.org/admin/wp-content/plugins/wp-pdfupload/pdf/191/LandscapeArch\\_Specs.pdf](http://compostingcouncil.org/admin/wp-content/plugins/wp-pdfupload/pdf/191/LandscapeArch_Specs.pdf)
  - 2. Submittal Requirements: Provide one-gallon (3.79-liter) sample with manufacturer's literature and material certification that the product meets the requirements.

## 2.03 COARSE SAND

- A. Clean, washed, natural sand, free of toxic materials.
  - 1. Coarse concrete sand, ASTM C33 Fine Aggregate, with a Fines Modulus Index of 2.8 and 3.2.

## 2.04 FERTILIZER

- A. If noted by the soil test recommendations, add slow-release, organic fertilizer based on soil test and plant requirements.
- B. Fertilizers should NOT be added to Bio-retention soils.
- C. Submittal Requirements: Provide manufacturer's literature that the product meets the requirements.

## 2.05 UNSCREENED PLANTING SOIL MIX

- A. A mixture of imported topsoil, coarse sand, and compost to make a new soil that meets the Project goals for the indicated planting area.
  - 1. The approximate mix ratio of imported topsoil, coarse sand and compost shall be:

Mix component	Percent by moist volume
Imported topsoil unscreened	50 to 60 percent
Coarse sand	30 to 40 percent
Compost	10 percent
  - 2. Final Tested Soil Organic Matter (OM): 2.75 to 4 percent (by dry weight loss ash burn).



- 
- B. Mix the coarse sand and compost together first and then add to the topsoil. Mix with a loader bucket to loosely incorporate the topsoil into the coarse sand/compost Mix. DO NOT OVER MIX. Do not mix with a soil-blending machine. Do not screen the soil. Peds (clumps/clods) of Soil, and loosely mixed Compost and coarse sand will be permitted in the overall mix.
  - C. At the time of soil installation, add fertilizer or biological amendments, if required, to the planting soil mix at rates recommended by the testing results for the plants to be grown.
  - D. Submittal Requirements: Provide a one-gallon (3.79-liter) sample with testing data that includes recommendations for chemical additives for the types of plants to be grown. Samples and testing data shall be submitted at the same time. The sample shall be a mixture of the random samples taken around the source stockpile or field. The sample shall be delivered with soil peds (clumps/clods) intact that represent the size and quantity of expected peds (clumps/clods) in the final delivered soil mix.

## 2.06 SCREENED PLANTING SOIL MIX

- A. A mixture of imported topsoil, coarse sand, and compost mixed off site to make a new soil that meets the Project goals for the indicated planting area.

- 1. A mix of imported topsoil, coarse sand and compost. The approximate Mix ratio shall be:

<u>Mix component</u>	<u>Percent by moist volume</u>
Imported topsoil screened	40 to 45
percent Coarse Sand	40 to 50
percent	
Compost	10 to 15 percent

- 2. Final Tested Organic Matter: 3 to 4.5 percent (by dry weight loss ash burn).
- 3. Final mix shall be thoroughly screened, mixed and blended.
- B. At the time of soil installation, add fertilizer or biological amendments, if required, to the planting soil mix at rates recommended by the testing results for the plants to be grown.
- C. Submittal Requirements: Provide a one-gallon (3.79-liter) sample with testing data that includes recommendations for chemical additives for the types of plants to be grown. Samples and testing data shall be submitted at the same time. The sample shall be a mixture of the random samples taken around the source stockpile or field.

## PART 3 – EXECUTION

### 3.01 INSTALLATION OF PLANTING SOIL IN SILVA CELLS

- A. Refer to Section 32 94 51 - Soil Cell.

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**SUBMITTAL CHECKLIST FOR REFERENCE ONLY**

Provide submittals required to the Design Professional for review and approval. The Submittal process may take up to 2 months prior to installation of the Silva Cell system and should be executed as soon as possible after the Contract is awarded. Testing will be at the expense of the Contractor.

**SOIL COMPONENT SUBMITTALS – SUBMITTED PRIOR TO SOIL MIXING**

- ☐ IMPORTED TOPSOIL
  - ☐ Lab analysis for physical and chemical composition
  - ☐ One-gallon (3.79-liter) sample
- ☐ COMPOST
  - ☐ Manufacturer's literature
  - ☐ Certificate of compliance with US Composting Council STA/TMECC requirements
  - ☐ One-gallon (3.79-liter) sample
- ☐ COARSE SAND
  - ☐ Manufacturer's literature
  - ☐ Lab analysis for physical and chemical composition
  - ☐ Manufactures Fines Modulus Index
  - ☐ One-gallon (3.79-liter) sample
- ☐ FERTILIZER
  - ☐ Manufacturer's literature

**SOIL MIX SUBMITTALS**

- ☐ UNSCREENED PLANTING SOIL MIX
  - ☐ Lab analysis for physical and chemical composition
  - ☐ One-gallon (3.79-liter) sample
- ☐ ☐ SCREENED PLANTING SOIL MIX
  - ☐ Lab analysis for physical and chemical composition
  - ☐ One-gallon (3.79-liter) sample
- ☐ ☐ BIO-RETENTION SOIL MIX
  - ☐ Lab analysis for physical and chemical composition
  - ☐ One-gallon (3.79-liter) sample

**END OF SECTION**

# **DIVISION 33**

## **UTILITIES**

**SECTION 33 10 00**  
**WATER DISTRIBUTION**

**PART 1 – GENERAL**

**1.01 SUMMARY OF WORK**

- A. Extent of Work: The extent of “Water Distribution” includes restoring the existing potable water system and constructing a fire water distribution system and appurtenances as shown on the Drawings.

**1.02 QUALITY ASSURANCE**

- A. Testing and Inspection for Contractor Quality Control: The Contractor shall perform the inspection and tests described below and, based upon the results of these inspections and tests, shall take the action required and shall submit specified reports.
  - 1. Sampling and Testing of Materials
  - 2. Field Tests and Inspections
  - 3. Tests for Pressure Lines
  - 4. Reports
- B. Qualification of Workmen: Provide at least one (1) person who shall be present at all times during execution of this portion of the Work, who will be thoroughly familiar with the type of materials being installed and the best methods for their installation, and who shall direct all work performed under this section.
- C. Codes and Standards: The Contractor shall comply with the applicable provisions of all pertinent codes and regulations. References made herein for manufactured materials, such as pipe, fittings, valves, hydrants and specialties, refer to designations for American Water Works Association (AWWA) or to American National Standards Institute (ANSI) formerly United States of America Standards Institute.

**1.03 SUBMITTALS**

- A. Product Data
  - 1. Submit all equipment and product data for review and approval prior to delivery to the job site.
  - 2. Approval and Listing: Valves and fittings shall be UL listed and FM approved.
  - 3. Manufacturer’s Certificates: Certify that products meet or exceed specified requirements.

- B. Shop Drawings, and Manufacturers' product data including piping, fittings, valves, couplings, fire department connections, piping, supports, maintenance data, recommended spare parts, labels, tags, and signage. Show complete system in shop drawings, including construction phasing.
  - 1. Include design calculations for pipe supports and indicate size and characteristics of components and fabrication details.
- C. Fire Protection System Support Submittal
  - 1. Design Calculations: Calculate the seismic forces acting on the Dock's standpipe system.
  - 2. Design Analysis: The pipe supports are not detailed fully in the Drawings. Submit detailed seismic bracing calculations based on ASCE/SEI 7-10 or NFPA 13. Design sway bracing, fasteners, assemblies, pipe hangers, and equipment supports.
  - 3. Support Details: Indicate fabrication and arrangement in accordance with ASCE/SEI 7-10 or NFPA 13. Detail attachments of restraints to be restrained items and to the structure. Show attachment locations, methods, and spacing. Identify components, list their strengths, and include directions and values of the prevailing forces (seismic, thrust, and expansion) transmitted to the structure during seismic events.
- D. Submit final test result for hydrostatic pressure testing, disinfection, bacteria testing, and taste testing in accordance with Section 7, 8, 9 of Division 9, Water Engineering Standards.

#### **1.04 PRODUCT HANDLING**

- A. Handle pipe to prevent damage to the pipe, pipe lining, or coating. Damage to the pipe, pipe lining, or coating, if any, shall be repaired to the satisfaction of the Engineer or replaced by the Contractor at their cost.
- B. Protect threaded pipe ends by couplings or other means until the pipe is placed in its final position.
- C. At times when pipe laying is not in progress, close the open ends of the pipe with a watertight plug or by other means approved by the Engineer to ensure absolute cleanliness inside the pipe.

### **PART 2 – PRODUCTS**

#### **2.01 PIPE**

- A. Pipe size and material for each section of pipe shall be as shown on the Drawings.
- B. Water main and service pipe material shall conform to the following:
  - 1. Potable Water Line – Copper Tubing
  - 2. Standpipe, buried – Ductile Iron Pipe

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- 3. Standpipe, under pier – Stainless steel above ordinary low water level
  - 4. Standpipe, float – High Density Polyethylene (HDPE), below water levels at all lake stages
  - 5. Marine Flex Hose – Flexible hose shall be approved for transitions of the standpipe at the gangway dock connection(s) as indicated in the Drawings.
- 
- C. Copper Tubing: ASTM B88, Type K, annealed
  - D. Ductile Iron Pipe: conform to AWWA Standard C150 and C151. Furnish pipe with push-on type joints as specified in AWWA C111, standard thickness Class 52. Furnish pipe with a standard bituminous outside coating and a standard thickness cement-mortar lining per AWWA C104.
  - E. Stainless Steel: Schedule 40 stainless steel type 316 meeting the requirements of ASTM A312 and A135. Pipe shall be listed for fire protection use.
  - F. HDPE: PE 4710, SDR 9, minimum 250 PSI, cell classification 445574C according to ASTM D3350, or approved equal.
  - G. Marine Flex Hose; Flexible hose shall be capable of bending in a minimum four (4) ft radius and be rated for 250 psi usage. Marine Flex Hose shall be Plicord Winline by Continental ContiTech or approved equal.

## **2.02 COUPLINGS AND FITTINGS**

- A. For the purpose of this specification, “couplings and fittings” shall include all devices, complete with accessories, intended to connect or cap piping of the various types, sizes, or shapes, either in-line or within a place of Work. “Couplings and fittings” shall not be construed to include valves of any sort or service. The word “joint” in these specifications shall be construed to include all required accessories.
- B. All fittings shall match the material of the adjacent pipe and have a pressure rating that meets or exceeds that of the pipe.
- C. All couplings shall be UL Listed or FM Approved.
- D. Copper:
  - 1. Fittings: ANSI/ASME B16.18 cast copper, or ANSI/ASME B16.22, wrought copper.
  - 2. Joints: Compression connections or ANSI/AWS A5.8, BcuP silver braze.
- E. Ductile Iron Pipe:
  - 1. Ductile Iron: Push-on type joints shall be Tyton Joint Field Lok 350 Gasket restrained joint gasket, Gripper Gaskets restrained joint gasket or approved equal and conforming to AWWA C111/A21.11.
  - 2. Ductile Iron: Fittings shall conform to AWWA C110, and AWWA C111, or AWWA C153 and shall be cement mortar lined conforming to AWWA C104.
  - 3. All fittings shall have a pressure rating that meets or exceeds that of the pipe.

4. All fittings shall be restrained joint fittings.

**F. Stainless Steel:**

1. Grooved and Shoulder Joints: Grooved and shoulder joints shall conform the AWWA C606.
2. Flange: Flange fittings shall conform to AWWA C207.

**G. HDPE:**

1. Molded type as recommended by the manufacturer. Fittings shall be of the same strength and standard as the pipe on which they are used. All HDPE pipe joints shall be fusion welded in accordance with the manufacturer's recommendations.

**2.03 EXPANSION JOINT**

- A. Molded rubber connector as indicated in the Drawings and shall match the size of the connecting pipes. Rubber expansion joint tube and cover material shall be EPDM. Expansion joints shall be rated for a minimum working pressure of 225 psi capable of a minimum movement of 1 inch of compression and 1.25 inches of extension. Rubber expansion joints shall be Proco 240-C, Precision DA, or approved equal.
- B. Expansion joint connectors shall be equipped with limit rods or cabling provided by the same manufacturer of the expansion joint. Expansion joint metal elements shall be 316 stainless steel, including but not limited to, flanges, limit rods or cables, plates, and hardware.

**2.04 VALVES**

- A. For the purpose of this specification "valves" shall include all devices, complete with accessories, intended to control, maintain, regulate, or prohibit the flow of water.
- B. General:
  1. The valves shall be of the standard pattern of a manufacturer approved by the Design Professional. They shall bear the name or mark of the manufacturer, the year the valve casting was made, size and working pressure cast in raised letters on the body of the valve.
- C. Type of Mounting:
  1. The valves shall be of the standard pattern of a manufacturer approved by the Design Professional. They shall bear the name or mark of the manufacturer, the year the valve casting was made, size and working pressure cast in raised letters on the body of the valve. Bronze mounted.
- D. Resilient Gate Valves:

1. Gate valves shall be ductile iron body and bonnet, ductile iron wedge copper-silicon alloy rising stem, Teflon-impregnated packing with bronze packing nut, threaded or soldered end connections, meeting the requirements of AWWA C509 and C550.  
Approved manufacturers: M&H and Kennedy.
- E. Check Valves:
  1. Check valves shall be gravity operated, swing check design. The check valve body shall be epoxy coated ductile iron or approved material. Wetted parts shall be manufactured of bronze or other approved non-corrosive materials.

## **2.05 STANDPIPE**

- A. All standpipes and associated components shall be designed for a minimum working pressure of 250 psi. All compounds shall be an approved non-corrodible material, approved by the Design Professional. The Contractor shall supply necessary couplers, nipples, and/or reducers necessary for connecting the specified valves and appearance. Connection threads shall be corresponding size and classification.
- B. Angle Hose Valve: 2 ½-inch brass Forgeline Bonnet and Seat Assembly valve with a minimum rating of 300 psi. Angled valve outlet shall be with Nation Standard Thread (NST). Angle valves shall have a 2 ½-inch NST brass cap and attached with brass chain.
- C. Fire Department Connection: as indicated in the Drawings.

## **2.06 CONCRETE FOR THRUST BLOCKS**

- A. Concrete compressive strength shall be minimum ~~3,000~~ 4,000 psi at 28 days and conform with the requirements of Section 03 30 00 – Cast-in-Place Concrete.

## **2.07 HANGERS**

- A. Hangers, where exposed to the weather or installed in a corrosive atmosphere, shall be protected against corrosion and be stainless steel.
- B. Acceptable Manufactures
  1. B-Line
  2. Anvil
  3. Fastenal
  4. Michigan Hanger
  5. PHD
  6. Tolco



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**PART 3 – EXECUTION**

**3.01 TRENCHING, BEDDING AND BACKFILL**

- A. Earthwork shall conform to the requirements of Section 31 00 00 - Earthwork.

**3.02 DEWATERING OF TRENCH**

- A. In the event that water is encountered or accumulates in the trench, it shall be removed prior to the pipe-laying operation and be maintained in a water-free condition until the ends of the pipe are sealed and provisions are made to prevent floating of the pipe. At no time allow trench water to enter the pipe.

**3.03 PIPE INSTALLATION**

- A. Install proper size increasers, reducers, and couplings where different sizes or materials of pipe and fittings are connected.
- B. Handling of Pipe:
1. During installation, handle the pipe as specified in Paragraph 1.04 above. Damaged or contaminated pipe shall be removed from the trench, cleaned, repaired as required and Contractor shall relay the pipe.
- C. Laying of pipe on curves:
1. Long-radius curves, horizontal, vertical, or combined, may be laid with standard pipe by deflections at the joints. When the centerline alignment of the pipe is described as a curve and no special fittings are indicated, lay the pipe on the curve by the joint deflection method using standard lengths of pipe. Where shorter lengths are required, the drawings will include a table of maximum lengths and offset deflections.
  2. Vertical curves or deflections not indicated on the drawings will be installed as directed by the Design Professional except for special fittings provided as directed.
- D. Laying ductile iron pipe:
1. Mechanical Joint Pipe:
    - a. General:
      - 1) When connecting mechanical joint pipe to bell and spigot or rubber-gasketed joint pipe, provide an adapter specially manufactured for the classes and type of pipe used.
    - b. Cleaning and Assembling Joint:
      - 1) Clean the inside of the bell and the last eight inches outside the spigot to remove oil, grit, tar [other than standard coating], and other foreign

material from the joint and then paint with a soap solution made by dissolving 1/2 cup of granulated soap in one gallon of water. Slip the ductile iron gland on the spigot end of the pipe, with the lip extension of the gland toward the socket or bell end. Paint the rubber gasket with the soap solution and place on the spigot end with the thick edge toward the gland.

c. Bolting of Joint:

- 1) Push the entire section of the pipe forward to seat the spigot end in the bell. Then press the gasket into place within the bell, being careful to have the gasket evenly located around the entire joint. Move the cast iron gland along the pipe into position for bolting, insert all of the bolts, and screw the nuts up tightly with the fingers. Tighten all nuts with a torque wrench in accordance with the following table.
- 2) Alternately tighten nuts spaced 180 degrees apart to produce equal pressures on all parts of the gland.

BOLT SIZE (INCHES)	RANGE OF TORQUE (FT. - LBS.)
5/8	40 - 60
3/4	60-90
1	70 - 100
1-1/4	90 - 120

2. Rubber Gasket Joint Pipe:

a. Cleaning and Assembling Joint:

- 1) Clean the inside of the bell to remove oil, grit, tar and other foreign material from the joint. Flex the circular rubber gasket inward and insert in the gasket seat provided in the socket, then release with the gasket fitting over the bead in the gasket seat. Apply a thin film of gasket lubricant to the inside surface of the gasket. Gasket lubricant shall be as supplied by the pipe manufacturer and approved by the Design Professional.
- 2) Clean the spigot end of the pipe and enter into the rubber gasket in the socket, using care to keep the joint from contacting the ground. Complete the joint by forcing the plain end to the bottom of the socket using a device approved by the Design Professional. Pipe which is not furnished with a depth mark shall be marked before assembly to ensure that the spigot end is inserted to the full depth of the joint.

b. Field-cut Pipe Lengths:

- 1) Shall be filed or ground to resemble the spigot end of manufactured pipe.

**E. Stainless Steel Pipe:**

1. Grooved and Shouldered - Make grooved type joints with the couplings specified for this type joint connecting pipe with roll-grooved ends or pipe with welded-on cut-grooved adapters. Groove pipe ends in the field only with manufacturer recommended groove rolling equipment and manufacturer recommended groove adapters in the field only with manufacturer recommended groove cutting equipment; use groove rolling and groove cutting equipment especially for the purpose and produced by a manufacturer of grooved joint couplings. Obtain approval for field-cut grooves before assembling the joint. Assemble grooved type joints in accordance with the recommendations of the coupling manufacturer.
2. Ensure that there is no metal-to-metal contact between dissimilar metals after the joint has been assembled.
3. Construct under dock utility supports as shown and within the maximum spacings, as shown.

**F. HDPE**

1. Butt Fusion: The joining method for HDPE pipe shall be the butt fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations. The butt fusion equipment used in the joining procedures should be capable of meeting all conditions recommended by the pipe manufacturer, including, but not limited to, temperature requirements of 400-450 degrees Fahrenheit, alignment, and an interfacial fusion pressure of 75 PSI. The butt fusion joining will produce a joint weld strength equal to or greater than the tensile strength of the pipe itself. All field welds shall be made with fusion equipment equipped with a McElroy Data Logger, temperature, fusion pressure, and a graphic representation of the fusion cycle shall be part of the quality control records.
2. Mechanical: Bolted joining may be used where the butt fusion method cannot be used. Flange joining will be accomplished by using a HDPE flange adapter with a ductile iron back-up ring. Mechanical joint joining will be accomplished using either a molded mechanical joint adapter or the combination of a Sur-Grip Restrainer and Pipe Stiffener as manufactured by JCM Industries, Inc. Either mechanical joint joining method will have a ductile iron mechanical joint gland.
3. Other: Socket fusion, hot gas fusion, threading, solvents, and epoxies may not be used to join HDPE pipe.

**G. Hanging and Supports:** Where the utility pipe is suspended from the dock, pier, or float, support piping to conform to the following:

1. Comply with MSS SP 58. Install hangers, supports, clamps, and attachments as required to properly support piping

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2. Design and space supports as indicated in NFPA 13 and ASCE/SEI 7-10. Comply with NFPA 13 or hanger material selection. Install additional supports for flow induced thrust and other concentrated loads, including valves, flanges, guides, strainers, and expansion joints, and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms.
  3. Install expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufactures written instructions.
  4. Install hangers and support and seismic bracing in accordance with NFPA 13 and ASCE/SEI 7-10, complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.
  5. Install hangers and support to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of flexible couplings , expansion loops, expansion bends, and similar units.
  6. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
  7. Pipe Slopes: Install hangers and supports to provided indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.9 are not exceeded.

H. Thrust Blocks:

1. Concrete thrust blocking shall be constructed in accordance with the details in the Drawings and WSDOT Standard Specifications Section 7-09.3(21).

**3.04 FIELD TESTS**

- A. Test all piping and appurtenances in accordance with the requirements of WSDOT Standard Specifications Section 7-09.3(23) and in accordance with local codes.
- B. All pressure testing shall be done in the presence of the Design Professional. Contractor shall provide plugs and temporary blow-off assemblies for pressure testing the pipes.
- C. The connection between existing and new pipes shall be pressure tested.

**3.05 FLUSHING AND DISINFECTION OF POTABLE WATER LINES**

- A. Before being placed in service, disinfect all new, repaired portions or extensions of potable water lines in accordance with the requirements of WSDOT Standard Specifications Section 7-09.3(24) and 7-09.3(24)A and the City of Mercer Island requirements.
- B. Dispose of test water in accordance with applicable regulations.

**END OF SECTION**

**SECTION 33 11 17**  
**HDPE IRRIGATION DISTRIBUTION PIPING**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. This section includes the requirements for installation of pressurized high-density polyethylene (HDPE) irrigation distribution pipe and fittings and governs pressurized irrigation distribution piping outside planting areas as shown on Drawings I-001 through I-024.

**1.02 RELATED SECTIONS**

- A. Section 31 00 00 – Earthwork
- B. Section 32 80 00 – Irrigation
- C. Section 32 81 13 – Irrigation Intake Screens
- D. Section 32 81 14 – Irrigation Filters
- E. Section 32 82 10 – Packaged Pump Stations
- F. Section 33 12 17 – Irrigation Distribution Valves

**1.03 REFERENCES**

- A. ASTM International (ASTM)
  - 1. ASTM D3350: Polyethylene (PE) Plastic Pipe and Fittings Materials
  - 2. ASTM F412: Terminology Relating to Plastic Piping Systems
  - 3. ASTM F714: PE Plastic Pipe (SDR-PR) Based on Outside Diameter
  - 4. ASTM F2206: Fabricated Fittings of Butt-Fused Polyethylene (PE) Plastic Pipe, Fittings, Sheet Stock, Plate Stock, or Block Stock
  - 5. ASTM F2620: Heat Fusion Joining of PE Pipe and Fittings
- B. Plastic Pipe Institute (PPI)
  - 1. PE4710 polyethylene compound listed in accordance with PPI TR-4
- C. Washington State Department of Transportation (WSDOT)
  - 1. Standard Specifications for Road, Bridge, and Municipal Construction (2024 Edition)

**1.04 SUBMITTALS**

- A. Submit the following in accordance with the Contract Documents:
  - 1. HDPE pipe

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- a. Submit data from the manufacturer showing pipe dimensions and material specifications.
  - b. Submit certification that pipe material meets specification requirements.
  - 2. HDPE pipe installation
    - a. Pipe deflection and minimum bending radius recommendations
    - b. Fusion recommendations
      - 1) Fusion temperature
      - 2) Interface pressure
      - 3) Cooling time
    - c. Fusion welder certification
  - 3. Filling and Testing Plan
    - a. Proposed rate, time, and procedure for filling and pressure testing the distribution pipe and appurtenances
    - b. Proposed method of disposing of water drained from pipeline to enable repair of leaks

#### **1.05 QUALIFICATIONS**

- A. Use personnel adequately trained and qualified to perform fusion joining of HDPE pipe.
- B. Use personnel skilled and experienced in laying HDPE pipe with butt fusion joints.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Do not drop pipe or fittings or subject the pipe to unnecessary jarring, impact, or other treatment that could damage the pipe. Follow the manufacturer's recommendations when hauling, unloading, handling, and storing the pipe. Do not push or pull pipe and fittings over sharp objects or drop anything onto the pipe and fittings.
- B. If any length of pipe shows kinks, buckles, cuts, gouges, or any other damage extending greater than 10% of the pipe wall thickness or that, in the opinion of the Owner's Representative will affect the performance of the pipe, the pipe shall be removed from the work site and replaced by a length of undamaged pipe of equal or greater design strength at the sole expense of the Contractor.
- C. Do not store pipe in direct sun or under any other conditions that would cause degradation of the pipe.
  - 1. At a minimum, wrap pipe in an adequately fastened opaque covering.
    - a. In warm climates, allow air circulation through and around the pipe by puncturing or cutting the covering in the area of the pipe ends.
- D. Support and store pipe above ground surface.
- E. Transport coated fittings with padded bolsters between the pipes. Use heavy padding under ties.

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**PART 2 – PRODUCTS**

**2.01 HDPE IRRIGATION PIPE AND FITTINGS**

- A. HDPE irrigation pipe shall meet the following requirements:
  - 1. Pipe shall be manufactured from a PE 4710 resin, as defined by the PPI.
  - 2. The resin material will meet the specifications of ASTM D3350 with a cell classification of 445574C.
  - 3. Pipe shall have a manufacturing standard of ASTM F714 and meet the requirements of American Water Works Association (AWWA) C901 for PE pipe 3 inches and smaller.
  - 4. Pipe shall be provided in the sizes and dimension ratios shown in the Pipe Schedule in the Drawings.
  - 5. Material shall be homogeneous and uniform in color, opacity, density, and other properties.
  - 6. Pipe shall be continuously marked with the name of the manufacturer, the nominal pipe size, the manufacturer's standard reference, and the production code.
  - 7. The pipe shall contain no recycled compounds except that generated in the manufacturer's own plant from resin of the same specification from the same raw material.
  - 8. Detectable marking tape and locating wire placed above the pipe shall be marked purple or labeled "non-potable."
- B. Fittings for HDPE irrigation shall meet the following requirements:
  - 1. HDPE fittings shall meet the requirements of ASTM F2206 and shall be made of the same material as the adjoining pipe.
  - 2. HDPE fittings shall have the same pressure rating as the adjoining pipe.
  - 3. Connections from HDPE to PVC pipe shall be made as shown on the Drawings.
  - 4. Connections from HDPE to flanged fittings shall be made using a molded HDPE flanged adapter with a ductile iron or stainless-steel backing ring.
  - 5. Where flanged fittings are required, flanges shall have bolt holes consistent with American Society of Mechanical Engineers/American National Standards Institute (ASME/ANSI) 16.1 Class 125 or ASME/ANSI B16.5 Class 150. Flanges and bolt holes shall be compatible with the adjoining pipe, valve, or fitting.

**2.02 RELATED ITEMS**

- A. Detectable marking tape and locating wire materials shall comply with Section 31 00 00 – Earthwork.
  - 1. Install detectable marking tape and locating wire over all buried, pressurized plastic irrigation pipe.
  - 2. Marking tape shall be purple or labeled "non-potable."

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3. Tape shall be placed at least 6 inches above the pipe and shall extend along the full length of the pressurized pipe.
  4. The locating wire shall be minimum 12-gauge copper multistrand RHW-type wire placed at least 3 inches above the pipe and shall extend along the full length of the pressurized pipe. Install the wire as a single continuous wire. Splicing of the wire, if necessary, shall be done in such a way as to produce an electrically and mechanically sound connection.

### **PART 3 – EXECUTION**

#### **3.01 LAYING PIPE**

- A. Excavation, pipe bedding, trench backfill, and compaction for HDPE irrigation distribution piping shall comply with Section 31 00 00 – Earthwork. Bedding materials, backfill materials, lift thicknesses, compaction methods, and required densities shall be as specified in Section 31 00 00 – Earthwork unless explicitly modified herein.
- B. Install HDPE pipe in accordance with the manufacturer's recommendations.
- C. Lay pipe to lines and grades shown in the Drawings within the following tolerances:
  1. Vertical departure: 1/4-inch
- D. Keep the pipe trench free of water during pipe installation.
- E. Carefully grade the pipe trench to provide uniform support along the bottom of the pipe and place a uniform lift of bedding.
- F. Bring HDPE pipe to within 5°F of earth temperature prior to cutting to length for placement.
- G. Complete joints prior to placing the pipe in the trench, per Article 3.02.
- H. Carefully lower pipe and accessories into the trench by means of a derrick, a nylon rope, belt slings, or other equipment that will not cause damage to the pipe.
- I. Rest the full length of each section of pipe solidly upon the compacted pipe bedding and place a lift of select backfill up to the pipe spring line.
- J. Make changes to alignment and grade by installing fabricated HDPE bends or by bending the pipe, as allowed by the manufacturer, to match the proposed alignment and grade. Minimum cold (field) bending radii shall be as shown in the Drawings or as recommended by the pipe manufacturer.
- K. After pipe laying and fusion joining operations are complete, clean the inside of the pipe and remove debris. When pipe laying is in progress, keep ends of pipelines closed.

#### **3.02 FUSION**

- A. Clean pipe of all shavings and other debris prior to joining pipe.



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- B. Join HDPE pipe by the method of thermal butt or side wall fusion as outlined in ASTM F2620. Perform fusion joining in accordance with the procedures established by the manufacturer.
  - C. Sections of PE pipe should be joined into continuous lengths on the job site above ground.
  - D. The butt fusion equipment used in the joining procedures should be capable of meeting all conditions recommended by the pipe manufacturer.
  - E. The butt fusion joining shall produce a joint weld strength equal to or greater than the tensile strength of the pipe itself.
  - F. Do not perform pipe fusion in water or when trench conditions are unsuitable for the Work. Prevent water from coming in contact with the fusion heater plate.
  - G. Socket fusion, hot gas fusion, threading, solvents, and epoxies are not allowed.

### **3.03 INSTALLATION OF CONNECTIONS TO EXISTING PIPE**

- A. Verify the locations, depths, and condition of the existing irrigation pipe at proposed points of connection before beginning the installation of the pipeline and making those connections.
- B. Furnish pipe, fittings, and other appurtenances needed to connect the proposed irrigation pipe to the existing irrigation system as shown in the Drawings.
- C. Take care to carefully place and compact bedding and backfill around each connection to ensure that connections to the pipe are not damaged during compaction and settlement of backfill over the pipe.

### **3.04 INSPECTION AND TESTING**

- A. HDPE pipe, fittings, and appurtenances shall be tested under a hydrostatic pressure of at least two times the maximum working pressure of the pipe.
- B. Hydrostatic pressure test procedures shall be in accordance with those outlined in Section 7-09.3(23) of the WSDOT *Standard Specifications for Road, Bridge, and Municipal Construction* (2024 Edition), except as modified herein.
- C. Test sections shall not exceed 1,500 feet in length.
- D. The Contractor shall provide pumps, hoses, fittings, and other equipment needed to perform the pressure tests. The Contractor shall also arrange for water to be made available for pressure testing.
- E. Disinfection is not required.
- F. Pressure testing shall be coordinated through and witnessed by the Owner's Representative. Notify the Owner's Representative at least 24 hours before applying pressure to the pipeline.

**END OF SECTION**

**SECTION 33 12 17**  
**IRRIGATION DISTRIBUTION VALVES**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. This section includes the following:
  - 1. Requirements for installation of gate valves with valve boxes for the irrigation intake and distribution system, as shown on Drawings I-001 through I-024 to provide isolation
  - 2. Requirements for installation of a drain valve assembly at the location shown on the Drawings
  - 3. Requirements for installation of a reduced pressure backflow assembly (RPBA) and enclosure at the location shown on the Drawings

**1.02 RELATED SECTIONS**

- A. Section 31 00 00 – Earthwork
- B. Section 32 80 00 – Irrigation
- C. Section 32 81 13 – Irrigation Intake Screens
- D. Section 32 81 14 – Irrigation Filters
- E. Section 32 82 10 – Packaged Pump Systems
- F. Section 33 11 17 – HDPE Irrigation Distribution Piping

**1.03 REFERENCE STANDARDS**

- A. American Water Works Association (AWWA)
  - 1. AWWA C509: Resilient-Seated Gate Valves for Water Supply Service
- B. Washington State Department of Transportation (WSDOT)
  - 1. WSDOT: Standard Specifications for Road, Bridge, and Municipal Construction (2024 edition)

**1.04 SUBMITTALS**

- A. Submit in accordance with the Contract Documents:
  - 1. Gate valves
    - a. Submit data from the manufacturer showing valve dimensions and material specifications.

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- b. Submit a certificate of compliance with AWWA C509 or C515.
  - c. Submit manufacturer's installation, operation, and maintenance instructions.
  - 2. Ball valves
    - a. Submit data from the manufacturer showing valve dimensions, pressure ratings, and material specifications.
    - d. Submit a certificate of compliance with American Society of Mechanical Engineers (ASME) B16.34.
    - e. Submit manufacturer's installation, operation, and maintenance instructions.

## **PART 2 – PRODUCTS**

### **2.01 VALVES**

- A. Gate valves
  - 1. Type: Resilient wedge, in accordance with AWWA C509 or C515
  - 2. Body: Ductile iron
  - 3. Stem: Non-rising, stainless steel
  - 4. Joints: Flanged
  - 5. Operator: Square-nut operator with operator extension (as needed)
  - 6. Lining and coating: Lined and coated at the place of manufacture with fusion-bonded epoxy
  - 7. Valves shall have a smooth, unobstructed waterway free from any sediment pockets.
  - 8. Each valve shall have the manufacturer's name, pressure rating, and year of manufacture cast on the body.
- B. Ball Valves
  - 1. Ball valves shall be used for nominal pipe sizes 2 inches and smaller where indicated on the Drawings
  - 2. Type: Full-port ball valve
  - 3. Standard: ASME B16.34
  - 4. Pressure Rating: Minimum 150 psi working pressure
  - 5. Body: Type 316 stainless steel
  - 6. Ball: Solid stainless steel, polished for smooth operation and corrosion resistance
  - 7. Seats: PTFE or reinforced PTFE suitable for irrigation water service
  - 8. Stem: Blowout-proof stainless steel stem with adjustable packing
  - 9. Ends:
    - a. Threaded ends for valves 2 inches and smaller, or
    - b. Flanged ends conforming to ASME B16.5 Class 150, where shown on the Drawings
  - 10. Operator: Hand wheel operator; provide locking handle where indicated

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11. Port: Full port with smooth, unobstructed waterway
  12. Valves shall be suitable for frequent operation and shall be capable of bubble-tight shutoff.
  13. Each valve shall be permanently marked with the manufacturer's name, pressure rating, and flow direction where applicable.

**C. Reduced Pressure Backflow Assembly (RPBA)**

1. Provide a reduced pressure backflow assembly for protection of the potable water system at the backup irrigation service connection to the potable water system.
2. Type: Reduced Pressure Backflow Assembly (RPBA)
3. Standard and Listings:
  - a. USC Foundation for Cross-Connection Control and Hydraulic Research (USC FCCCHR) – Approved Assemblies
  - b. Washington State Department of Health (DOH) – Approved Backflow Prevention Assemblies
4. Size: 2-inch nominal diameter unless otherwise shown on the Drawings
5. Pressure Rating: Minimum 175 psi working pressure
6. Body: Lead-free bronze or stainless steel suitable for potable water service
7. Ends: Flanged or grooved ends, as shown on the Drawings
8. Valves:
  - a. Two full-port resilient-seated shutoff valves integral to the assembly
  - b. One hydraulically operated relief valve located between check valves
9. Test Cocks: Four test cocks arranged in accordance with USC and as shown on the Drawings
10. Other Materials and Appurtenances:
  - a. As shown on the drawings.
11. Orientation: Installed above grade in a horizontal orientation
12. Installation of the RPBA shall be approved by the City of Mercer Island, and shall be subject to required clearances, elevation above finished grade, and drainage provisions

**2.02 RELATED EQUIPMENT**

**A. Valve Boxes**

1. Carson 1730-24 polymer concrete meter box with locking cover, or approved equal
2. Covers shall be clearly marked "IRRIGATION" in molded lettering.
3. Each valve box shall be complete with a cover and installed to extend continuously from a minimum of 6 inches below the valve to the finished ground surface.

**B. RPBA Enclosure**

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1. Provide a protective enclosure for the reduced pressure backflow assembly.
  2. Enclosure Type: Exterior-grade insulated fiberglass enclosure
  3. Basis-of-Design: Hot Box fiberglass flip-top insulated enclosure, or approved equal
  4. Material: Fiberglass-reinforced construction suitable for exterior exposure
  5. Insulation: Factory-installed insulation suitable for freeze protection
  6. Access: Hinged or flip-top lid providing full access for testing, maintenance, and repair
  7. Locking: Lockable lid or hasp compatible with Owner-provided lock
  8. Drainage: Enclosure shall allow drainage of relief valve discharge without ponding
  9. Sizing Requirements: The enclosure shall be sized to fully accommodate the RPBA, shutoff valves, test cocks and required clearances.
  10. Contractor shall verify enclosure size based on the selected RPBA manufacturer and required testing and maintenance clearances prior to procurement.

### **PART 3 – EXECUTION**

#### **3.01 PREPARATION**

- A. Inspect valves upon delivery at the site to ensure proper working order. Verify that valves operate from the fully opened to fully closed position without sticking or binding. If valves stick or bind, repair or replace them before installation.
- B. Clean flanges or threads, bolts, and nuts with a wire brush.
- C. Lubricate bolts with oil and graphite before installation.
- D. Lubricate valve operators in accordance with the manufacturer's recommendations.

#### **3.02 INSTALLATION**

- A. Valves shall be installed in the locations shown on the Drawings and in accordance with the manufacturer's recommendations.
- B. Install valves so that bolt holes straddle the horizontal and vertical centerlines of the pipe run to which the valves are connected.
- C. Valves and valve boxes shall be set plumb. Valve boxes shall be set flush with the finish ground surface.
- D. Install RPBA assemblies and enclosures in accordance with manufacturer's recommendations and City of Mercer Island requirements.
- E. Arrange assemblies to allow testing, maintenance, and relief valve discharge without obstruction.
- F. Coordinate RPBA inspection and testing with the City of Mercer Island prior to placing the irrigation system into service.

**END OF SECTION**

**SECTION 33 24 13  
MONITORING WELLS**

**PART 1 – GENERAL**

**1.01 SUMMARY OF WORK**

- A. Extent of Work: The work for "Monitoring Well Decommissioning and Protection" includes the protection of existing monitoring wells during construction and decommissioning of existing wells.
- B. All work shall be conducted according to WAC 173-160 (Minimum Standards for Construction and Maintenance of Wells), Chapter 18.104 RCW (Water Well Construction Act) and these Specifications.

**1.02 QUALIFICATIONS OF FIRM PERFORMING WELL INSTALLATION, DECOMMISSIONING, REFURBISHMENT AND PROTECTION**

- A. Work must be performed by a firm licensed for well installation, refurbishment and decommissioning as required in WAC 173-162 (Regulation and Licensing of Well Contractors and Operators).

**1.03 PROTECTION OF EXISTING WELLS**

- A. During work activities it is the responsibility of the Contractor to protect existing monitoring wells which have not been designated for decommissioning. Work shall be conducted to prevent damage to existing monitoring wells.
- B. If a historic well is encountered in the work zone, the Contractor shall survey the well and notify the Design Professional.

**1.04 RECORD KEEPING**

- A. Contractor shall notify the Washington State Department of Ecology (Ecology) of their intent to construct, refurbish or decommission a well, at least seventy-two hours before starting work. Well Construction Notification shall be submitted on forms provided by Ecology. Contractor shall report the completion of all monitoring well work on Well Record forms and submit them to Ecology within thirty (30) days of completion of well work. The Contractor shall submit to the Design Professional a copy of all Well Construction Notification forms and Well Record forms. Submit a copy of each Ecology submittal to the Design Professional. In addition, provide a copy of all Ecology submittals at close of project.

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**1.05 REFERENCES**

- A. Boring logs are provided in the Appendix.

**1.06 SUBMITTALS**

- A. Ecology forms as noted in Section 1.04
- B. Survey coordinate data

**PART 2 – PRODUCTS**

Not Used.

**PART 3 – EXECUTION**

**3.01 NOTICE**

- A. Contractor shall provide 5 working days of notice to the Design Professional and Owner's Representative prior to well decommissioning monitoring wells.

**3.02 PROTECTION OF MONITORING WELLS DURING CONSTRUCTION ACTIVITIES**

- A. Contractor shall be responsible for the protection of monitoring wells during construction activities. Contractor shall repair wells identified to remain or be protected, which become damaged during construction activities at no cost to the Owner.
- B. Wells identified to be protected, which are damaged and unable to be repaired, shall be decommissioned and replaced at Contractor's expense.

**3.03 DECOMMISSIONING WELLS**

- A. Monitoring wells shall be decommissioned in accordance with the Drawings or as approved by the Design Professional and in accordance with WAC 173-160.
- B. The criteria for decommissioning wells includes: improper installation, location of well interferes with work activities, damaged well or completion of use.
- C. Method of Decommissioning Well:
  - 1. When well log records are available an enviroplug or grout may be used. Decommissioned wells shall be sealed and returned to the existing grade.
  - 2. When well log records are not available, the well shall either be pressure grouted or over-drilled and grouted and the surrounding area returned to the existing grade.
  - 3. Monitoring wells located within areas of proposed excavation shall be decommissioned prior to excavation. The decommissioning procedure shall take into account the depth of the planned excavation in relation to the depth of the monitoring well filter pack and surface seal. In the event the excavation extends

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below the surface seal, the Contractor shall decommission the well by over-drilling and removing the well casing and filter pack, in accordance with WAC 173-160-465.

**3.04 SURVEY OF TOP CASING ELEVATION**

- A. Survey the top of the monument and the top of the well casing in the project vertical datum.

**3.05 WASTE GENERATED DURING DECOMMISSIONING**

- A. All waste materials generated from the installation, refurbishment and decommissioning of monitoring wells shall be disposed off-site at the Contractor's expense and according to all pertinent federal and state requirements.

**END OF SECTION**



**SECTION 33 31 00**  
**SANITARY SEWER UTILITIES**

**PART 1 – GENERAL**

**1.01 SUMMARY OF WORK**

- A. The location and extent of the "Sanitary Sewer Utilities" work is indicated on the Drawings. The work includes the requirements for furnishing and installing sanitary sewer pipes, and sanitary sewer lift station.

**1.02 QUALITY ASSURANCE**

- A. The Owner will provide testing and inspection services to the satisfaction of the Design Professional. The Contractor may obtain test results from the Design Professional at no cost. Tests conducted for the sole benefit of the Contractor, or before a product is approved, shall be at the Contractor's expense.
- B. Qualification of Workmen: Employ at least one person who shall be present at all times during execution of this portion of the work, shall have all portions of the Drawings and Specifications applicable to that portion of the contract, shall be thoroughly familiar with the type of materials being installed and the best methods for their installation, and shall direct all work performed under this Section.
- C. Codes and Standards: The Contractor shall comply with the applicable provisions of all pertinent codes and regulations. References made herein for manufactured materials such as pipes, fittings, and specialties refer to designations for the latest edition of materials published by the American Association of State Highway and Transportation Officials (AASHTO), the American Society for Testing Materials (ASTM), the American Public Works Association (APWA) Standard Specification for Municipal Public Works Construction, and the current version of the WSDOT/APWA Standard Specifications for Road, Bridge and Municipal Construction.

**1.03 SUBMITTALS**

- A. Furnish manufacturers' technical literature, standard details, product specifications, and installation instructions for all products. At a minimum, submittals shall include the following:
  - 1. Pipe, fittings, and accessories.
  - 2. Pumps
  - 3. Lift Station Controls

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4. Vaults and Lids

**PART 2 – PRODUCTS**

**2.01 PIPING AND FITTINGS**

- A. Pipe size and material for each section of pipe shall be as shown on the Drawings.
- B. For the purpose of this specification, “couplings and fittings” shall include all devices, complete with accessories, intended to connect or cap piping of the various types, sizes, or shapes, either in-line or within a place of Work. “Couplings and fittings” shall not be construed to include valves of any sort or service. The word “joint” in these specifications shall be construed to include all required accessories.
- C. All fittings shall match the material of the adjacent pipe and have a pressure rating that meets or exceeds that of the pipe.
- D. Polyvinyl Chloride Pipe (PVC)
  - 1. ASTM D 3034, SDR 35 with bell-and-spigot ends for gasketed joints with ASTM F 477, elastomeric seals.
  - 2. ASTM E 1785 Schedule 40 Pipe, with plan ends for solvent-cement welded joints with ASTM D 2466, Schedule 40 socket-type fittings.
- E. Galvanized Steel: Hot-dipped galvanized steel pipe conforming to ASTM A53, galvanized inside and outside of pipe. Unless noted otherwise in the Drawings, all galvanized steel pipe shall be Schedule 40.
  - 1. Couplings and Fittings: Malleable iron threaded fittings shall meet the requirements of ANSI B2.1 and have a minimum pressure rating of 150 pound per square inch. Material shall meet requirements of ASTM A47M, Grade 32510.

**2.02 LIFT STATION**

- A. Wet-Well Classification
  - 1. The lift station and valve vault are classified spaces, Class 1, Division 2 per the National Electrical Code and NFPA 820. All parts, components and appurtenances located in the lift station and valve vault shall be designed to meet NEC Class 1 Division 1 requirements per NFPA 820 unless approved by the Design Professional.
- B. Lift Station Structure and Valve Vault: Lift station structure and valve vault shall be of precast concrete and shall be made up from the components indicated on the Drawings.
- C. Submersible Sump Pumps
  - 1. Lift station pumps and all appurtenances shall be provided by a single manufacturer and shall be designed to work as an integrated unit.

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2. The lift pumps shall be as noted on the Drawings and shall be a duplex submersible sewage grinder pump system of the submersible quick-disconnect type. The system shall be designed to permit ground level removal of pumping units from the wet well for inspection or service without disconnection or disturbing the discharge piping and for automatic reinstallation when they are lowered into place by positively locking the valve in position.
  3. The system shall include heavy-duty, submersible, sewage grinder pumps with close-coupled submersible electric motors which shall be designed for use in hazardous locations and carry U.L. Class 1, Group D label. The quick-disconnect feature shall provide a positive hydraulic seal. Each motor shall be designed for continuous duty and have dual shaft seals and built-in thermal overload protection. The inner seal chamber shall have moisture-sensing probes.
  4. Pumps shall be centrifugal and oriented in a vertical position.
  5. Casing: grey cast iron pump body.
  6. Manufacturers: Hydromatic or approved equal.
  7. Pump Discharge size: as shown on Drawings.
  8. Impeller: Hard iron, stainless steel shaft.
  9. Bearings: The motor bearings shall be sealed and permanently grease lubricated with high temperature grease.
  10. O-rings: Nitrile rubber, fluorinated rubber or manufacturer's standard.
  11. Fasteners: All fasteners exposed to pumped liquids shall be stainless steel.
  12. Certificates: FM approved, rated for Class 1, Div. 1 Installations.
  13. Accessories: Oil resistant cord and plug for connection to electric wiring system including grounding connector. Stainless steel FM approval nameplate.  
Power/Signal Cable: Each pump shall come with a minimum of 50 feet of combined signal/power cable. The Contractor shall coordinate with the Drawings and increase the length of factory provided cable as necessary to install the cable per manufacturer's recommendations.

Protection: Each pump motor stator shall incorporate three thermal switches, one per stator phase winding and be connected in series, to monitor the temperature of the motor. Should the thermal switches open, the motor shall stop and activate an alarm. The thermal switches shall be connected to a Mini CAS control and status monitoring unit. The Mini CAS unit shall be designed to be mounted in the pump control panel.

**D. Guide Rail System**

1. Quantity: Two complete (2) guide rail systems, one system for each pump
2. Type: Guide rail system shall be a rail system. The guide rail system shall be fully compatible with the pumps specified.

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3. Components: The guide rail systems shall each include:
    - a. Cast iron or ductile iron discharge elbow with guide arms
    - b. Hydraulic Sealing Flange: Cast iron or Ductile iron
    - c. Carrier Guide Bracket: Stainless steel sliding guide bracket with corrosion resistant finish. The carrier shall be mounted on each pump and designed to lift from centered loop.
    - d. Fasteners: All fasteners shall be 316 stainless steel.
    - e. Lifting Chains: 316 stainless steel lifting cable, sized according to pump weight and of sufficient length to extract the pump from the lowest sump depth. Include SS wall-mounted chain hook and fastening hardware. One chain and hook per pump.
  4. CHECK VALVES: Check valves shall be flanged pattern, ductile iron body with brass trim and shall bear the name or trademark of the manufacturer and working pressure cast or stamped in the valve body. Check valves shall be Kennedy Valve Kenflex Resilient Hinged Check Valve Figure 506, or approved equal. External fasteners shall be 304 SS. The valve shall meet the requirement of AWWA C508.
  5. LIFT STATION VAULT APPURTENANCES
    - a. Floats: Roto – Float type S or approved equal
  6. CONTROL PANEL
    - a. Enclosure: Nema 4x.
    - b. Components: The control panel shall be pre-wired and factory tested and shall be UL-approved per control panel manufacturer.
  7. HATCHES: Hatches shall be designed according to ASTM C1802. AASHTO Load Level 2.

## **2.03 MANHOLE**

- A. Manholes shall be of precast concrete with ductile iron castings. Materials shall be in accordance with the applicable references within WSDOT Standard Specifications Section 7-05.2.
  1. Ladders and other steel components exposed to the interior of the structure shall be a copolymer polypropylene plastic molded on galvanized steel reinforcing bar and shall follow the requirements of ASTM A36 and ASTM C478.
  2. Access hatch shall be the size as indicated in the Drawings. Access hatch lid shall be locking and spring assisted opening.
  3. Provide watertight rubber gaskets at matching segments of precast units.
  4. Grout shall be dry packaged, hydraulic-cement grout (non-shrink) conforming to ASTM C1107 and ASTM C827.
- B. Pipe-to-structure connections

1. Unless otherwise noted, provide water-tight flexible pipe-to-structure connector where pipe is shown to penetrate structures on the Drawings. Product shall be compatible with the pipe material and size specified. Product shall meet the requirements of ASTM C923. Product material of construction shall be resistant to hydrocarbons. Provide all appurtenances and accessories including band clamps, fasteners, and wedge connectors. All appurtenances and accessories shall be 316 stainless steel.
  - a. New Pipe Connection to New Structure: When new pipe is being connected to new structures, the pipe run shall continue into the structure and connect with a watertight seal per the project specifications. Excess pipe shall be cut flush within the structure unless noted otherwise.
  - b. The pipe material and external diameter must be measured and reported to the manufacturer prior to procurement.
  - c. The structure opening diameter must be measured and reported to the manufacturer prior to procurement.
  - d. Watertight flexible pipe-to-structure connectors shall meet the following performance requirements.

Test	ASTM Method	Product Test Performance
Head Pressure	C923 – 7.1	+13 psi for 10 minutes
Deflection Test	C923 – 7.2.2	+7°
Load Test	C923 – 7.2.3	Over 150 lbs/in. pipe diameter
Tensile Strength	D412	1580 psi
Hardness	D2240 (shore A durometer)	48 ± 5
Accelerated Oven-Aging	D573 70± 1°C for 7 days	10.1% tensile decrease 14% elongation decrease
Compression Set	D395, method B, at 70°C for 22 hours	13% increase
Water Absorption	D471	0.8% increase
Ozone Resistance	D1171	Rating 0
Low-temperature Brittle Point	D746	No fracture at -40°C
Tear Resistance	D624, method B	No tear at 210 lbf/in

- C. Pipe couplings and flexible pipe pieces
  1. General: For typical pipe joints refer to pipe material specifications. Other joint devices shall be furnished where called for on the Drawings and as specified below.
  2. Flexible Couplings:
    - a. Manufacturer: Fernco Strong Back RC5000 or approved equal conforming to ASTM C1173.

- 1) Sleeve: Fabricated stainless steel.
    - 2) Clamps: Type 316 Stainless steel.
  - b. Manufacturer: GPT Industries Link-Seal LS400 or approved equal.
    - 1) Hardware: Type 316 Stainless steel (no zinc coating).
    - 2) Gasket: Nitrile rubber.
- D. Sealant gaskets
  - 1. Type: Preformed, continuous rope form plastic material, protected by removable two-piece wrapper.
  - 2. Sealing Compound: Reinforced hydrocarbon resins blended with plasticizing compounds and reinforced with inert mineral filler. No solvents, irritating fumes or noxious odors.
  - 3. Adhesive and Cohesive Strength: Not dependent on oxidizing, evaporating, or chemical action.
  - 4. Conform to Federal Specification SS-S-210.
  - 5. Provide:
    - a. RAM-NEK as manufactured by K. T. Snyder Company, Inc., Houston, TX;
    - b. QUIKSEAL as supplied by Associated Concrete Products, Santa Ana, CA;
    - c. JP Specialties, Lake Elsinore, CA;
    - d. or approved equal.

## **2.04 VALVES**

- A. Gate Valves: Unless noted otherwise, all gate valves shall be resilient wedge gate valve complying with ANSI/AWWA C515.

Check Valves: Check valves shall be flanged pattern, ductile iron body with brass trim and shall bear the name or trademark of the manufacturer and working pressure cast or stamped in the valve body. Check valves shall be Kennedy Valve Kenflex Resilient Hinged Check Valve, Val-Matic Swing-Flex Check Valve, or approved equal. External fasteners shall be 304 SS. The valve shall meet the requirements of AWWA C508.

## **PART 3 – EXECUTION**

### **3.01 GENERAL**

- A. It shall be the Contractor's responsibility to verify the actual locations (horizontal and vertical) of all utilities prior to beginning excavation. Utilities to remain in place shall be protected from damage during construction operations.

### **3.02 EARTHWORK**

- A. Excavation, bedding, and backfilling shall be as specified in Section 31 00 00 - Earthwork.

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**3.03 SURVEY**

- A. Contractor survey crews shall stake, paint, or otherwise mark locations for manholes, cleanouts, and other structures as well as cut depths for pipe trenches. Contractor survey shall provide verification for the line and grade during installation to ensure that the Work is within the following allowable tolerances:
  - 1. Fine-grade and prepare bedding so the pipe can be initially placed with a variation from true line or grade, measured at each joint, of not more than 1/16 inch per inch diameter or 1/2 inch maximum, provided that:
    - a. A resulting level or back sloping length of pipe does not occur; and
    - b. No more than one-half of the permissible variation shall be accumulated between successive joints.
  - 2. Pipe laid within these tolerances shall not be subjected to any further adjustment. Measurement for grade shall be taken at the pipe invert (not top of pipe) before manhole, catch basin, or other underground structures are covered. Eccentricity of pipe barrels, with respect to jointing surfaces, shall not produce grade interruption adverse to flow of more than 1/4 inch maximum.
  - 3. Contractor shall coordinate with Owner and Design Professional for inspection of survey and verification of pipes, and manholes.

**3.04 PROTECTION AND HANDLING**

- A. Protect all drainage structures and associated appurtenances from damage during transport and storage and cover UV sensitive materials. Storage surfaces should be free from dirt, mud and debris.
- B. Store and protect all drainage structures and associated appurtenances in accordance with the manufacturer's recommendations.
- C. Chains or cable type chokers will not be allowed when lifting manholes. Nylon or other wide fabric slings or other similar lifting apparatus with spreader bars shall be used where necessary.
- D. Manholes and associated appurtenances shall not be dropped or mishandled. All materials and equipment shall be examined before installation and no piece shall be installed which is found to be defective. Any damage to the manholes or associated appurtenances shall be repaired as directed by the manufacturer and approved by the Design Professional. If any defect is discovered after the manholes have been installed then the structure shall be removed and replaced at the Contractor's expense. The Design Professional shall approve the replaced and reinstalled manhole, when the Contractor has installed it in place to the grade and elevation shown in the plans.

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**3.05    INSTALLATION OF PIPE**

- A.    Furnish all necessary tools, equipment, labor and materials for the Work to pump, bail or otherwise remove any water which accumulates in the trench. Perform all work necessary to keep the trench clear of water while the foundation and the masonry are being constructed or the pipe is being laid. Contractor shall comply with the Section 31 23 19 – Dewatering, while conducting dewatering activities at the project site.
- B.    Placing Pipe:
  - 1.    Place the pipe in pipe zone bedding material, as specified in Section 31 00 00 – Earthwork and install in accordance with AWWA C600. The pipe shall conform to the grade and alignment indicated on the Drawings. The entire pipe barrel shall be uniformly supported with pipe zone bedding material along the entire length of pipe, without load concentrations at pipe bell and spigot joints. Provide small depressions in the pipe zone bedding material for pipe bells, when utilized. Make minor adjustments to line and grade by scraping away or filling in with pipe zone bedding material. Do not support pipes on blocks or mounds of any nature. Provide flexible joints capable of angular deflection within 12 inches of the structure for pipes 12-inch and smaller or 1 ½ times the nominal diameter for larger pipe sizes.
  - 2.    Unsuitable material found during excavation shall be removed at the direction of the Design Professional. Quarry spalls shall be placed as backfill or as directed by the Design Professional. See Section 31 00 00 – Earthwork.
  - 3.    Contractor shall install pipe in a manner which keeps the internal portion of the pipes clean and free from debris, dirt, and other objectionable materials. Contractor shall remove all soil, aggregate, and foreign matter from the pipe interior, prior to installation and thoroughly clean all joints before joining pipe sections. The Contractor shall cover both ends of the pipe with plastic and not uncover ends until just prior to completing the joint.
  - 4.    SDR 35 ASTM D3034: Take care to properly align the pipe and clean the bell and spigot or tongue of the pipe. When the pipe has gaskets, gaskets shall be straight, properly lubricated and without twist. The pipe shall be partially supported by hand, sling, or crane, as required, to minimize lateral pressure on the gasket and to maintain concentricity until the pipe has been forced into final longitudinal position in accordance with the manufacturer's recommendations. Pipe handling, after the gasket has been affixed, shall be carefully controlled to avoid bumping the gasket and, thus, knocking it out of position or loading it with dirt or other foreign material. Gaskets so disturbed shall be removed, cleaned, relubricated, and replaced before the joint is attempted.
  - 5.    PVC, Schedule 40 shall be installed in accordance with ASTM F 1668. Solvent cement joints shall be made in a two-step process with primer conforming to ASTM F 656 and solvent cement conforming to ASTM D 2564.



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**3.06    INSTALLATION OF MANHOLES**

- A.    Furnish all necessary labor, materials or equipment to pump, bail or otherwise dewater the trench or pit for the duration of the construction and backfilling operations. Contractor shall comply with the Section 31 23 19 – Dewatering, while conducting dewatering activities at the project site.
- B.    Contractor shall coordinate construction of manholes with other disciplines to assure proper rim elevations. Place manholes at the elevation, location and upon the appropriate bedding indicated on the Drawings, prepared in accordance with Section 31 00 00 – Earthwork. Contractor shall scarify and compact existing material at the bottom of the trench and/or structure excavation hole to a depth of 1 feet below the section indicated in the Drawings unless otherwise noted. After scarification and compaction to 95% maximum density (unless otherwise noted).
- C.    Contractor shall construct cast-in-place manholes in accordance with the Drawings. Concrete and reinforcing steel shall conform to the requirements of Division 3 – Concrete of these Specifications.
- D.    Precast manholes shall follow WSDOT type and size as shown in the Drawings.
- E.    Carefully place the pre-cast manholes on the prepared bedding so as to be fully and uniformly supported in true alignment, making sure that all entering pipes can be inserted on proper grade.
- F.    All lift holes and all joints between precast elements shall be thoroughly wetted and then completely filled with non-shrink grout, smoothed and pointed both inside and out, to ensure water tightness. Non-shrink grout shall meet ASTM C1107, with no shrinkage as measured by ASTM C827. Contractor shall provide a premixed product, consisting of properly proportioned amounts of non-metallic, dimensionally stable material to which water is added.
- G.    Place precast sections and align to provide vertical sides and vertical alignment of the ladder rungs. The completed manhole shall be rigid, true to dimensions and watertight.
  - 1.    In precast manholes sections where steel loops have been provided in lieu of lift holes, remove the loops flush with the inside wall surface after the manhole has been completed and in place. No sharp cutoff protrusions will be permitted. If concrete spalling occurs as a result of the loop removal, restore the spalled area with mortar to a uniformly smooth surface.
- H.    Grade Adjustments:
  - 1.    Construct manholes, of the type noted on the Drawings, to provide adjustment space for setting cover fastenings to a finished grade. The grades shown in the Drawings for manhole construction indicate the approximate top grade +/- 0.10 foot, and the final grade will be set by the Contractor and approved by the Design Professional after backfilling has been completed. No separate payment for final adjustment of the

cover castings for new construction will be made, and all costs thereof will be considered as incidental and be included in the unit contract price for the manhole. Coordinate the activities of all trades so that this tolerance is achieved.

- I. Ensure that there is no metal-to-metal contact between dissimilar metals after the joint has been assembled.
- J. Pipe Connections:
  - 1. Structures shall be precast in accordance with Section 03 40 00 – Precast Concrete, with all connection openings pre-cored to the appropriate size for connection of specified sanitary sewer pipe with flexible pipe connector.
  - 2. Connect pipes at pre-cored holes using water-tight flexible pipe-to-structure connectors. Use specified flexible connectors and mortar grout connection as necessary to form a tight seal. Place pipe ends flush or cut off flush with the inside face of the structure unless otherwise noted in the Drawings.
  - 3. Make all internal precast concrete vault section joints watertight with non-shrink grout. Non-shrink grout shall meet ASTM C1107, with no shrinkage as measured by ASTM C827. Contractor shall provide a premixed product, consisting of properly proportioned amounts of non-metallic, dimensionally stable material to which water is added.
- K. Backfill:
  - 1. Hand-place backfill around the manhole, extending at least one pipe length into each trench and tamp with selected material up to an elevation of six inches above the crown of all entering pipes. Contractor shall conform to the applicable provisions of Section 31 00 00 – Earthwork.
  - 2. Backfill around all the drainage structures with gravel borrow material or suitable on-site material. Compact the backfill material to 95% maximum dry density from the pipe bedding and base slab up to final finish grade, over an area defined as being within a distance of 4 feet from the exterior walls of the drainage structures. Refer to Section 31 00 00 – Earthwork for requirements for reuse of on-site material.
- L. Ladder and ladder rungs:
  - 1. Ladder rungs shall be grouted inside the concrete walls of the precast manhole. Rungs shall be vertically aligned and spaced at 12 inches apart.
  - 2. Step rungs on City of Mercer Island manhole structures shall be installed as shown on WSDOT Standard Plan B-30.90.02.
- M. Manholes shall be watertight.

**3.07 LIFT STATION**

- A. Assemble discharge piping and valves and make all pipe connections in accordance with the Drawings.
- B. The Contractor shall install the pumps and floats in the lift station as indicated in the Drawings and per manufacturer's recommendations.
- C. The Contractor shall provide all conduits and conductors to connect the lift station to the existing control panel to provide an operational system.

**3.08 ACCEPTANCE TESTING**

- A. After completion of the following, authorization from the Design Professional shall be required before the Contractor can perform acceptance testing:
  - 1. Acceptable placement of applicable pipe, bedding, and backfill material.
  - 2. Acceptable debris removal, cleaning, and flushing of all applicable pipes and structures.
- B. Contractor shall perform testing as required by Section 7-17.3 (2) Cleaning and Testing of the WSDOT Standard Specifications for Road Bridge and Municipal Construction, 2018 Edition. Infiltration Testing shall be required where the pipe is installed below the ground water table.

**3.09 LIFT STATION STARTUP**

- A. The Contractor shall conduct startup testing of the lift station including the following:
  - 1. Startup, check, and cycle each pump individually as well as operating together. Using clean water, cycle each pump through a full pump down of the manhole.
  - 2. Check high-level alarm.
- B. Witnessing
  - 1. Field testing will be witnessed by the Design Professional.
  - 2. Provide three (3) days advance notice of field testing.

**END OF SECTION**

**SECTION 33 40 00**  
**STORM DRAINAGE UTILITIES**

**PART 1 – GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. The location and extent of the "Storm Drainage Utilities" work is indicated on the Drawings. The work includes the requirements for furnishing and installing storm drainpipes, underdrain, outfall, tide gate, storm clean outs, storm drain structures, covers, frames, fittings, and appurtenances and all testing for pipes, structures and other underground conveyance items identified in the drawings.

**1.02 QUALITY ASSURANCE**

- A. The Owner will provide testing and inspection service to the satisfaction of the Design Professional. The Contractor may obtain test results from the Design Professional at no cost. Tests conducted for the sole benefit of the Contractor, or before a product is approved, shall be at the Contractor's expense.
- B. Qualification of Workmen: Employ at least one person who shall be present at all times during execution of this portion of the work, shall have all portions of the Drawings and Specifications applicable to that portion of the contract, shall be thoroughly familiar with the type of materials being installed and the best methods for their installation, and shall direct all work performed under this Section.
- C. Codes and Standards: The Contractor shall comply with the applicable provisions of all pertinent codes and regulations. References made herein for manufactured materials such as pipes, fittings, and specialties refer to designations for the latest edition of materials published by the American Association of State Highway and Transportation Officials (AASHTO), the American Society for Testing Materials (ASTM), the American Public Works Association (APWA) Standard Specification for Municipal Public Works Construction, and the current version of the WSDOT/APWA Standard Specifications for Road, Bridge and Municipal Construction.

**1.03 SUBMITTALS**

- A. Furnish manufacturers' technical literature, standard details, product specifications, and installation instructions for all products. At a minimum, submittals shall include the following:
  - 1. Pipe, fittings, and accessories.
  - 2. Manholes and catch basins.

3. Catch basin inlets and frames
4. Cleanout cover and frame.
5. Tide gate.

## **PART 2 – PRODUCTS**

### **2.01 STROM DRAINAGE PIPING AND FITTINGS**

- A. Pipe size and material for each section of pipe shall be as indicated in the Drawings.
- B. For the purpose of this specification, “couplings and fittings” shall include all devices, complete with accessories, intended to connect or cap piping of the various types, sizes, or shapes, either in-line or within a place of Work. “Couplings and fittings” shall not be construed to include valves of any sort or service. The word “joint” in these specifications shall be construed to include all required accessories.
- C. All fittings shall match the material of the adjacent pipe and have a pressure rating that meets or exceeds that of the pipe.
- D. Polyvinyl Chloride (PVC)
  1. ASTM D 3034, SDR 35 with bell-and-spigot ends for gasketed joints with ASTM F 477, elastomeric seals.
  2. ASTM E 1785 Schedule 40 Pipe, with plan ends for solvent-cement welded joints with ASTM D 2466, Schedule 40 socket-type fittings.
- E. Underdrain
  1. PVC: ASTM D 2729 with two rows of minimum ½-inch diameter holes at 120 degrees apart, parallel to the pipe’s axis. Hole spacing along pipe of a maximum of 5-inches on center. Solvent-cement welded joints.
  2. Corrugated Polyethylene pipe: Single wall, slotted perforations, meeting the requirements of WSDOT Standard Specifications Section 9-05.2.
- F. High-Density Polyethylene (HDPE)
  1. HDPE, SDR 11 shall meet the requirements of WSDOT Standard Specifications Section 9-05.23.

### **2.02 NONPRESSURE TRANSITION COUPLINGS**

- A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground nonpressure piping. Include ends of same sizes as piping to be joined, and corrosion-resistant-metal tension band and tightening mechanism on each end.
- B. Sleeve Materials:
  1. For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.

- 2. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.
- C. Unshielded, Flexible Couplings:
  - 1. Description: Elastomeric sleeve with stainless-steel shear ring and corrosion-resistant-metal tension band and tightening mechanism on each end.
- D. Shielded, Flexible Couplings:
  - 1. Description: ASTM C 1460, elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.
- E. Ring-Type, Flexible Couplings:
  - 1. Description: Elastomeric compression seal with dimensions to fit inside bell of larger pipe and for spigot of smaller pipe to fit inside ring.

## **2.03 MANHOLES AND CATCH BASINS**

- A. Manholes and Catch Basins shall be of precast concrete and shall be made up from the components indicated on the Drawings.
  - 1. Manhole Rings and Covers shall be ductile iron castings of the size and style indicated on the Drawings.
  - 2. Metal Frame and Grate for Catch Basins or Inlets shall be cast steel or ductile iron of the size and style indicated on the drawings.
    - a. Inlets placed in paved areas shall be ADA compliant
  - 3. Cast Metal Inlets shall be cast steel or ductile iron of the size and style indicated on the drawings.

## **PART 3 – EXECUTION**

### **3.01 GENERAL**

- A. It shall be the Contractor's responsibility to verify the actual locations (horizontal and vertical) of all utilities prior to beginning excavation. Utilities to remain in place shall be protected from damage during construction operations.

### **3.02 EARTHWORK**

- A. Excavation, bedding, and backfilling shall be as specified in Section 31 00 00 – Earthwork, of these Specifications.

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**3.03 SURVEYS**

- A. Layout of alignment and grade of site drainage piping shall be established by a Land Surveyor State licensed in Washington. Check the line and grade during installation to ensure that the Work is within the following allowable tolerances:
  - 1. Fine-grade and prepare bedding so the pipe can be initially placed with a variation from true line or grade, measured at each joint, of not more than 1/32 inch per inch diameter or 1/2 inch maximum, provided that:
    - a. A resulting level or backsloping length of pipe does not occur; and
    - b. No more than one-half of the permissible variation shall be accumulated between successive joints.
    - c. Pipe laid within these tolerances shall not be subjected to any further adjustment. Measurement for grade shall be taken at the pipe invert, NOT TOP OF PIPE. Eccentricity of pipe barrels, with respect to jointing surfaces, shall not produce grade interruption adverse to flow of more than 1/4 inch maximum.

**3.04 INSTALLATION OF STORM DRAINAGE PIPING**

- A. Furnish all necessary machinery for the work and pump, bail, or otherwise remove any water which accumulates in the trench. Perform all work necessary to keep the trench clear of water while the pipe is being laid.
- B. Placing: Place the pipe from downstream to upstream with the bells pointing upstream in appropriate bedding graded to conform with the grades and alignment indicated on the Drawings and prepared as specified. Ensure that the pipe has a full, solid bearing along its entire length. Provide small depressions for pipe bells when utilized. Make minor adjustments to line and grade by scraping away, or filling in with, bedding material. Do not support pipes on blocks or mounds of any nature.
- C. Jointing: Take care to properly align the pipe and clean the bell and spigot or tongue of the pipe. When the pipe has gaskets, gaskets shall be straight, properly lubricated and without twist. The pipe shall be partially supported by hand, sling, or crane, as required, to minimize lateral pressure on the gasket and to maintain concentricity until the pipe has been forced into final longitudinal position in accordance with the manufacturer's recommendations. Pipe handling, after the gasket has been affixed, shall be carefully controlled to avoid bumping the gasket and, thus, knocking it out of position or loading it with dirt or other foreign material. Gaskets so disturbed shall be removed, cleaned, relubricated, and replaced before the joint is attempted.
- D. Apply sufficient restraint to the line to ensure that the joints, once home, are held so by tamping fill material under and alongside the pipe. At the end of the day's work, block the last pipe in such a manner as may be required to prevent creep during down time.

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**3.05 INSTALLATION OF UNDERDRAIN PIPING**

- A. Furnish all necessary machinery for the work and pump, bail, or otherwise remove any water which accumulates in the trench. Perform all work necessary to keep the trench clear of water while the pipe is being laid.
- B. Jointing: Underdrain pipe shall be joined using either the flexible elastomeric seal conforming to the requirements of ASTM D3212, or solvent cement welded conforming to the requirements of ASTM D2564. Polyethylene drainage tubing shall be jointed with snap-on, screw-on bell and spigot, or wraparound coupling bands as recommend by the manufacture of the tubing.

**3.06 INSTALLATION OF CATCH BASINS**

- A. Furnish all necessary labor, materials, or equipment to pump, bail, or otherwise dewater the trench or pit for the duration of the construction and backfill period.
- B. Catch Basins
  - 1. Place catch basins at the elevation and location indicated on the Drawings upon the appropriate bedding prepared in accordance with Section 31 00 00 – Earthwork.
  - 2. Carefully place precast catch basins on the bedding so as to be fully and uniformly supported in true alignment, making sure that all entering pipes can be inserted to the proper grade.
  - 3. All lift holes and all joints between precast elements shall be thoroughly wetted and then completely filled with mortar, smoothed and point both inside and out, to ensure watertightness.
  - 4. Place precast sections and align to provide vertical sides and vertical alignment of the ladder rungs. The completed catch basin shall be rigid, true to dimensions and watertight.
  - 5. In precast catch basin sections where steel loops have been provided in lieu of lift holes, remove the loops flush with the inside wall surface after the catch basin installation has been completed. No sharp cutoff protrusions will be permitted. If concrete spalling occurs as a result of the loop removal, restore the spalled area with mortar to a uniformly smooth surface.
- C. Grade Adjustment: The manhole/catch basin casting frame or casting ring may be either cast into a concrete collar or set flange down on pre-cast concrete adjustment rings and mortared, as directed by the Design Professional. Provide not less than eight inches or more than 16 inches between the top of the cone or slab and the underside of the casting ring for adjustment of the casting ring to grade. Bricks for grade adjustment shall not be used. Location of manholes/catch basins will be staked by the Contractor.



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- D. Pipe Connections: Place all pipes entering or leaving the structure on firmly compacted bedding, particularly within the area of the structure excavation, which normally is deeper than that of the utility trench. All openings in the walls of catch basins constructed with precast sections for the insertion of pipe connections and outlet trap castings shall, after pipe or castings have been placed to their final position, be grouted tight in place to present a smooth uniform surface inside and outside. Pipe placed through walls to which connections be placed so that the socket end of the pipe is backed against the outside surface of the catch basin as closely as practicable for the angle of entrance. The spigot end of the pipe shall be cut square with the last point of contact with the inside wall surface. Provide flexible joints within 12 inches of the catch basin structure.
  - E. Backfill: Hand-place backfill around the catch basin, extending at least one pipe length into each trench and tamp with selected material up to an elevation of six inches above the crown of all entering pipes. Conform to the applicable provisions of Section 31 00 00 – Earthwork.

### **3.07 ACCEPTANCE TESTING**

- A. After completion of the following, authorization from the Design Professional shall be required before the Contractor can perform acceptance testing:
  - 1. Acceptable placement of applicable pipe, bedding, and backfill material.
  - 2. Acceptable completion of all applicable grout work.
  - 3. Acceptable debris removal, cleaning, and flushing of all applicable pipes and structures.
- B. Contractor shall perform testing as required by Section 7-17.3 (2) Cleaning and Testing of the WSDOT Standard Specifications, current Edition. Infiltration Testing shall be required where the pipe is installed below the ground water table.
- C. Before final acceptance, the Contractor shall inspect all drainage lines by the use of a television camera, utilizing an Owner approved independent inspection service company. The television inspection requirements shall include the provisions of:
  - 1. A color analog/digital camera with pan and tilt capacity in order to view all main lines, lateral lines, and structures including channels.
  - 2. A one-inch reference ball to be mounted to the camera in order to drag along the bottom of the pipe during the entire inspection procedure.
  - 3. Linear measure references to be measured from the center of the beginning structure to the center of the next inline structure and include the direction of flow. The locations of lateral pipes and all distinctive pipe conditions shall be referenced to the centerline of the beginning structure. All structure references shall utilize the designated structure reference numbers shown on the plans.

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- D. The following television inspection information shall be provided to the Design Professional:
1. A clear movie format on DVD which encompasses the limits of the inspection area and including all reference data as described herein. A tape reference time and date for the start of each run shall also be indicated.
  2. A written report shall be provided corresponding to the taped inspection and including all reference data as described herein. The report shall consist of a written narrative of all distinctive pipe conditions including ponding areas in excess of ¼ inch.

**END OF SECTION**

**SECTION 33 46 00**  
**SUBDRAINAGE**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. This section includes requirements for furnishing and installing subdrainage systems consisting of perforated pipe, infiltration trench aggregate, geotextile fabric, and associated appurtenances for dispersal of irrigation system filter backwash water.
- B. Work under this section includes excavation of the infiltration trench, placement of perforated subdrain piping, infiltration trench construction, aggregate bedding and backfill, geotextile installation, and connection of backwash discharge piping from the irrigation filtration system. The subdrainage system shall be constructed to promote infiltration, prevent soil migration, and avoid surface ponding or erosion.
- C. This Section is limited to subdrainage systems constructed solely for the purpose of dispersing irrigation system filter backwash water, as shown on the Drawings.
- D. Work under this Section does not include drainage systems associated with pervious pavements, Silva Cell systems, structural soil cells, or stormwater management facilities provided under other sections of the Contract Documents.

**1.02 RELATED SECTIONS**

- A. Section 31 00 00 – Earthwork
- B. Section 32 80 00 – Irrigation
- C. Section 32 81 14 – Irrigation Filters
- D. Section 33 11 17 – HDPE Irrigation Distribution Piping

**1.03 SUBMITTALS**

- A. The Contractor shall submit the following in accordance with the Contract Documents:
  - 1. Subdrainage System
    - a. Manufacturer's product data for perforated pipe, fittings, cleanouts, and accessories.
    - b. Product data for geotextile fabric, including material type, weight, apparent opening size (AOS), and permeability.
    - c. Gradation and source information for drainage aggregate.
  - 2. Operation and Maintenance Manuals
    - a. Recommended inspection and maintenance procedures for the subdrain system.

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- b. Guidance for sediment removal, flushing, or rehabilitation if reduced infiltration performance is observed.

## **PART 2 – PRODUCTS**

### **2.01 PERFORATED SUBDRAIN PIPE**

- A. Perforated subdrain pipe materials and perforation requirements shall comply with Section 33 40 00 – Storm Drainage Utilities, Underdrain Piping. Provide PVC underdrain piping where indicated on the Drawings.
- B. Diameter: As shown on the Drawings.
- C. Cleanouts: Provide solid pipe risers with removable caps at locations shown on the Drawings.

### **2.02 DRAINAGE AGGREGATE**

- A. Material: Clean, hard, durable crushed stone or washed gravel.
- B. Gradation: Uniformly graded aggregate with nominal size between 3/4 inch and 1 1/2 inch unless otherwise shown on the Drawings.
- C. Fines Content: Less than 2% passing the No. 200 sieve.
- D. Condition: Free of organic material, clay, silt, or other deleterious substances.
- E. Provide gradation and source testing submittals in accordance with Section 31 00 00 – Earthwork.

### **2.03 GEOTEXTILE FABRIC**

- A. Geotextile fabric shall comply with Section 31 00 00 – Earthwork.

## **PART 3 – EXECUTION**

### **3.01 SITE PREPARATION**

- A. Verify locations, elevations, and slopes of the subdrainage system prior to excavation.
- B. Coordinate subdrain alignment with irrigation piping, utilities, trails, and adjacent structures to avoid conflicts.
- C. Protect existing improvements and vegetation in accordance with the Contract Documents.

### **3.02 EXCAVATION AND TRENCHING**

- A. Excavation and trenching shall be in accordance with Section 31 00 00 – Earthwork.
- B. Excavate trenches to the dimensions and elevations shown on the Drawings.

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- C. Maintain trench stability and protect adjacent surfaces, including gravel trails, from collapse or damage.
  - D. Excavate unsuitable materials and replace with approved drainage aggregate.
  - E. Dispose of excess or unsuitable excavated materials in accordance with the Contract Documents.

### **3.03 INSTALLATION**

- A. Place geotextile fabric to line the trench, with sufficient overlap at seams to fully encapsulate the drainage aggregate as shown on the drawings.
- B. Place drainage aggregate to the required depth and grade prior to installation of perforated pipe.
- C. Install perforated subdrain pipe true to line and grade, with perforations oriented as recommended by the manufacturer.
- D. Provide cleanouts at locations shown on the Drawings.
- E. Connect irrigation filter backwash discharge piping to the subdrain system using solid-wall pipe and compatible fittings.
- F. Place drainage aggregate around and over the perforated pipe to the elevation shown on the Drawings.
- G. Fold geotextile fabric over the top of the aggregate to fully cover the infiltration trench.
- H. Complete backfill above the geotextile using approved materials and compact in accordance with Section 31 00 00 – Earthwork.

### **3.04 FIELD QUALITY CONTROL**

- A. Inspect installed subdrain components prior to backfilling to verify:
  - 1. Proper pipe alignment, slope, and connections
  - 2. Correct placement and encapsulation of geotextile fabric
  - 3. Clean, uncontaminated drainage aggregate
- B. Correct deficiencies prior to proceeding with backfill.

**END OF SECTION**

**DIVISION 35**

**WATERWAY AND MARINE CONSTRUCTION**

**SECTION 35 31 23.16**  
**CONCRETE WAVE ATTENUATOR FLOAT**

**PART 1 – GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. The Contractor shall furnish all tools, equipment, materials, and supplies and shall perform all labor, supervision, fabrication, assembly, and installation of a complete concrete float wave attenuator and mooring system.

**1.02 CONTRACTOR SITE INSPECTION**

- A. The Contractor shall examine the job site before preparing their Shop Drawings to verify all physical conditions and surroundings if necessary.
- B. The floats shall have a draft of 4 feet, a dead load freeboard of 2 feet, and a width of 10 feet as required for strength, stability, and meeting the requirements of these Specifications.

**1.03 TECHNICAL REQUIREMENTS**

- A. Sufficient floatation shall be provided to support a live load of 40 pounds per square foot of deck area, with a minimum freeboard of not less than 12 inches.
- B. Freeboard under dead load only shall not be less than 24 inches.
- C. Contractor should exercise caution to ensure that all dead loads are accurately determined and included in buoyancy calculations. These loads should include appropriate safety factors if used and any specific manufacturing considerations that will affect the final freeboard.
- D. Dead loads shall consist of the floats, framing, waler system, attachment steel, miscellaneous connection devices, and all other permanently attached equipment such as cleats, rub rails, fire water stand pipe and supports, transition plates, safety equipment, ladders, etc.
- E. Loads from the connecting gangway reactions including all appurtenances, including but not limited to attached utilities, transition plates, etc.) shall also be coordinated and accounted for in the design.
- F. The weight of lumber for these calculations shall be assumed at no less than 40 pounds per cubic foot.
- G. Walking surface of concrete floats shall be level and flush with respect to the adjacent floats.

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- H. Floats shall be designed to float level under dead load only. The decks of the floats shall be within the following tolerances of being level:
1. Maximum transverse slope for main floats: 1 inch per 10 feet of width
    - a. Maximum longitudinal slope: 1 inch per 10 feet

#### **1.04 REFERENCES**

- A. All structures and components must be designed to the following codes or authorities, depending upon the application:
1. International Building Code, (IBC)
  2. American Institute of Steel Construction (AISC)
  3. American Concrete Institute (ACI)
  4. American Welding Society (AWS) D1.1 Structural Welding Code – Steel
  5. American Welding Society (AWS) D1.4 Structural Welding Code – Reinforcing Steel
  6. American Society of Testing and Materials (ASTM)
  7. National Design Specification (NDS) for Wood Construction
  8. American Institute of Timber Construction (AITC)
  9. American Society of Mechanical Engineers (ASME)
  10. American Wood-Preservers' Association (AWPA)

#### **1.05 PARAMETERS**

- A. Calculations are to be performed for wind and current loads both parallel to and perpendicular to the wave attenuator mooring float.
- B. Allowable material stresses shall be based on the latest edition of the International Building Code as amended by the State of Washington and the City of Mercer Island, Washington.
- C. Design wind and wave loads shall be as shown on the Contract Drawings.

#### **1.06 CALCULATIONS**

- A. All design calculations shall assume that all reasonable dead loads have been incorporated into the system.
- B. Once the loads are determined by the applicable codes listed above in conjunction with the Drawings, the delegated design and calculations shall be prepared in accordance with all pertinent specifications and guidelines.
- C. All engineering and calculations shall be performed in accordance with these guidelines using the appropriate allowable capacities and safety factors. Calculations are to be stamped by a Professional Engineer registered in the state of Washington, maintaining professional liability insurance with a minimum policy limit of \$1,000,000 or other project requirements.



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- D. In addition to sizing all members for these codes and Specifications, the following calculations shall be submitted as a minimum for the wave attenuator system:
1. Anchorage attachment points to ensure reactions shall be at the steel piles as shown on the Contract Drawings.
  2. Overall system loads under full occupancy with consideration for deflections of the system and its effects on anchor allowable pile loading.
  3. Anchorage system capacity for individual and overall load consideration.
  4. Vertical loading due to wave action and live load requirements.

#### **1.07 QUALITY ASSURANCE**

- A. The manufacturer must have an ongoing quality assurance program. At the option of the Owner, the manufacturer shall submit a copy of their operational quality assurance program and shall cast no floats until the Owner has approved this quality assurance program.
- B. The manufacturer must have an ongoing quality management system. This quality system must be regularly assessed and currently certified as meeting Pre-cast Concrete Institute Standards.

### **PART 2 – PRODUCTS**

#### **2.01 GENERAL**

- A. The Contractor shall submit, for approval by the Owner, all items intended for the construction of this Project, as well as any alternate materials.
- B. The Owner will be allowed access to all sites where materials pertaining to this Contract are manufactured or constructed for purposes of inspection.
- C. Materials delivered and stored at either the manufacturing facility, staging area, or job site shall be properly stored on dunnage or by other appropriate means to prevent direct contact with the ground and unnecessary damage.

#### **2.02 CONCRETE FLOATS**

- A. Float modules shall be cast monolithically in a single pour. There shall be no cold joints of any type.
- B. Float modules shall have a minimum deck thickness of 6 inches and a minimum side wall, end wall, and bottom thickness of 6 inches. Final section thickness will be determined by the Contractor during the project engineering phase.
- C. Floats shall be cast in steel forms, with a smooth, true surface. Forms shall be designed in such a way to prevent unsightly finished surfaces or definite lines that could result in crack planes. Any rough edges, form marks, or defects shall be cleaned, ground smooth, or

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patched. Float forms shall have a tolerance of not more than 1/8 inch from the dimensions shown on the shop drawings. Floats cast from forms more than 1/2 inch out of square (when measured diagonally) may be rejected.

- D. Concrete shall be vibrated internally and/or externally to assure a smooth dense finish. The placement will be such that the concrete float is monolithic with no cold joints in any part of the finished float.
- E. Concrete shall have a minimum 28-day compressive strength of 4000 psi, per ASTM C-94.
- F. The mix shall contain a minimum of 564 pounds (six sacks) of Portland cement per cubic yard, either Type I or Type II modified, and low alkali.
- G. Concrete for the flotation units shall contain polypropylene fibrous reinforcement at a rate recommended by its supplier.
- H. The theoretical concrete unit weight shall not be more than 120 pounds per cubic foot for lightweight or 150 pounds per cubic foot for standard weight concrete.
- I. Coarse and fine aggregates shall conform to ASTM C-33-86, ASTM C-330 lightweight aggregates for structural concrete.
- J. All concrete shall be air-entrained from 4% to 7% and shall be tested in accordance with ASTM C-138, C-173, or C-231.
- K. Water/cement ratio shall not exceed 0.45 for light-weight concrete.
- L. Slump range shall be 3 inches to 6 inches when tested in accordance with ASTM C-143-78.
- M. All concrete testing shall be done under guidance by certified personnel. Certification shall be in accordance with the National Ready Mix Concrete Association guidelines or equivalent. All concrete testing methods shall be done in accordance with the respective ASTM specifications. Four compressive test cylinders shall be taken daily per mix, cured, and tested by either an independent testing laboratory or by an on-site, Owner approved, certified testing facility. Test results will be submitted on one each, 7-day; two each, 28-day; and one hold cylinder. Unit weight and entrained air tests will be taken daily from the same material sample used for the compressive test cylinders. Daily concrete cylinder test reports may be submitted to the Owner on a job complete basis.
- N. Galvanized welded wire fabrication if used as concrete reinforcement shall be 2" X 2" - 14/14. Welded wire fabric is required in the deck and the bottom sections with a minimum of a 2-inch return to the sides and ends. Where splicing occurs, the overlap will be a minimum of 4 inches. Galvanized wire mesh shall meet ASTM A-185.
- O. Rebar shall be grade 60, conform to ASTM 615, and shall be epoxy coated in accordance with ASTM A775.
- P. The closed cell expanded polystyrene (EPS) core used inside the concrete unit shall meet Federal Specification C-578-85 which superseded Federal Specification HH-I-524C. The foam shall weigh between 0.95 and 1.10 pounds per cubic foot. EPS to have a maximum absorption of 3% by volume as tested by ASTM Method C-272. Foam core may not have

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more than 10% reground EPS foam material. Reground foam pieces shall not exceed 3/8 inch in diameter.

- Q. The foam core shall be held in a true position during the casting operation with an allowable variation of 1/8 inch from the dimensions shown on the Shop Drawings. Foam billets will have a dimensional tolerance of plus 1/8 inch and minus 1/8 inch. Foam core shall be made up of not more than four laminated sections. The laminated foam core shall be glued with a low solvent glue to prevent delamination during transportation and handling. No horizontal lamination may occur in the upper 10 inches of the foam core.
- R. The float deck surface shall be trowel finished with a steel trowel and a slip-resistant finish applied transversely to the walking surface. Contractor shall establish finishing methods and procedures to ensure an even and consistent broomed or screed finish on all deck surfaces. All top edges shall have a 3/8-inch tooled radius with a minimum 1-1/2-inch-wide smooth hard steel finished face. Outside top edges and corners shall be filed smooth.
- S. Except as otherwise approved, floats shall be cured for a minimum of 7 days before transporting or assembling. The Contractor shall select their own method of curing and be responsible for the result, except that all curing shall be under cover and with complete protection from direct sunlight, wind, and freezing for a minimum period of 3 days.
- T. Floats shall be protected against damage from any cause. Any damaged units may be rejected and removed from the assigned job.
- U. Cracks that are determined to be structural in nature by the Design Professional and not located in the deck of the module shall be V-cut out and patched with a non-shrink patching compound approved by the Owner. Contractor shall submit the proposed patching compound and repair procedure for review and acceptance by the Design Professional prior to performing the repair. Cracks that are determined to be structural in nature by the Design Professional, which are located in the deck of the float module, shall be patched in accordance with methods and materials approved by the Owner and the Design Professional on a case-by-case basis. The Design Professional shall determine if excessive cracking in a single flotation unit shall be cause for rejecting that unit. Any frequently recurring pattern of cracking shall be considered indicative of inadequate design, improper handling, or improper production procedures and shall be corrected by the manufacturer immediately upon its discovery.
- V. Rock pockets exceeding 1 inch in diameter and/or 1/2 inch in depth and/or honeycombing, shall be patched with an approved non-shrink grout of a color similar to the cured concrete. Any pockets that expose mesh or rebar shall be chipped out, cleaned, and filled with an approved epoxy patching compound.

## **2.03 THROUGH-ROD CONNECTIONS**

- A. The minimum dimension for all horizontal through-rods for structural attachment is 3/4-inch thread diameter.

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- B. All horizontal through-rods shall be placed within PVC sleeves cast in the float units. The maximum inside diameter of PVC shall not exceed 7/8 inch.
  - C. All cast in inserts will be galvanized steel, 3/4-inch diameter, with a welded loop or horizontal restraining bar. Inserts shall be inserted to match existing floats to enable reuse of the hinges.
  - D. Rub-boards shall be securely fastened to the concrete floats using galvanized through-rods, plate washers, spur locker washers, and nuts.
  - E. No connecting device shall protrude beyond the fascia into the berth area. Any connecting device protruding above the surface of the deck shall have a low, rounded profile.
  - F. The minimum dimension for all vertical through-rods for attachment of the HDPE wearing members is ½-inch thread diameter. Vertical through rods must be countersunk so they do not extend above the deck surface once installed.

#### **2.04 PLASTIC LUMBER**

- A. All rub boards and walers shall be high density polyethylene (HDPE) or approved equivalent, color - Grey.
- B. Plastic lumber shall be fabricated accurately to provide uniform gaps and butt joint connections. Splices shall not exceed 1/2 inch between adjoining ends.
- C. All walers, rub boards, fascia, spacers, or any other member that is subject to foot traffic shall be flush with the concrete walking surface.
- D. Tie bands used for delivery must have plates between the bands and the plastic lumber to prevent crushing. Bundle identification shall be done so as not to plastic lumber surfaces.

#### **2.05 STEEL**

- A. All structural steel channels, angles, and plates shall be fabricated from mild steel conforming to ASTM A-36, and shall be hot dipped galvanized after fabrication.
- B. A hot dipped galvanized coating shall be required on all through-rods, bolts, miscellaneous hardware, cleats, steel plates, angles, and shapes in accordance with either ASTM A-123 or ASTM A-153 as the process applies to the specific material.
- C. Zinc coating thickness shall be a minimum of 3 mils.
- D. Galvanized coatings damaged from handling or other means shall be repaired with hot-stick galvanizing to achieve a minimum 12 mil thickness. A 2 mil minimum coating of zinc rich spray or brush-applied coating shall follow the stick galvanizing.

#### **2.06 HARDWARE**

- A. Bolts, nuts, washers, and through-rods shall be mild steel, in accordance with ASTM A-307 and have a minimum of 1-1/2 inch of thread.
- B. All mild steel hardware shall be hot dipped galvanized in accordance with ASTM A-123.

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- C. Washers shall be used with all nuts and bolts which bear on wood or steel. Round plate washers shall be used on all through-rods bearing on wood surfaces. Cut washers shall be used on all surfaces bearing on steel surfaces.

**PART 3 – EXECUTION**

**3.01 STAGING**

- A. The Contractor shall stage all floats off site until immediately prior to installation.

**3.02 CONSTRUCTION**

- A. Install components as shown on the Drawings, using galvanized bolts, plate washers, and nuts.
- B. Use Sea Dog 12" galvanized iron hex-head open base dock cleats, or approved alternative.
- C. Deliver completed floats to the site ready to be installed, with all appurtenances installed.
- D. All work shall be performed in accordance with the Hydraulic Project Approval (HPA), Shoreline Variances, and other permits associated with this project.

**END OF SECTION**

**SECTION 35 42 00**  
**WATERWAY BANK PROTECTION**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. Work described in this section includes furnishing all labor, materials, tools, equipment, and incidentals required for importing, stockpiling, and placing imported waterway bank protection materials for the purposes of achieving required grades, slopes, and elevations, as described on the Drawings. This includes, but is not limited to, the following:
  - 1. Habitat gravel
- B. All materials in this section shall be imported and obtained by the Contractor.
- C. The Contractor shall calculate its own estimate of the quantity of material to be used for the backfill and shoreline protection material placement activities based on the Contractor's own calculation methods, the excavation and backfill/shoreline protection design as shown on the Drawings, and the Contractor's means and methods for placement activities to account for the Contractor's equipment tolerances.

**1.02 SUBMITTALS**

- A. Submit a Borrow Source Characterization Report in accordance with the requirements of this Specification prior to completion of any on-site backfill and shoreline protection material placement activities. The Borrow Source Characterization Report will include, at a minimum, the following:
  - 1. General: The Contractor shall ensure and provide documentation that imported materials are natural materials; are free of contaminants, including debris; and meet construction Specifications. All import materials shall require certification or testing to verify that the material does not contain toxic materials in exceedance of allowable levels given their intended use (in water or on land). Prior to borrow source sampling, the Contractor shall provide documentation of the origin of borrow source materials and maps identifying the specific locations of borrow sources.
  - 2. Material Sources: Submit a list of the sources for all materials to be imported and placed. Coordinate with the Owner and Design Professional for pre-construction inspection of the source material-supplier facilities.
  - 3. Materials Characterization: A characterization of any and all imported material shall be performed by the Contractor prior to any on-site placement. The characterization will include analysis of a borrow source sample, site inspection, and site characterization.

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4. Data Sheets: The Contractor shall provide documentation that imported materials meet the requirements of these construction Specifications. Submit materials data sheets describing each product listed in this Specification for evidence of consistency with the Specifications.
  5. Testing: The Contractor (or its material supplier) shall conduct physical testing to confirm that the materials meet the Specification requirements for use at the site. Materials must meet the gradation Specifications provided in this section. The samples for all materials to be imported must be tested for grain size distribution (ASTM International [ASTM] D7928), or additional gradation information must be provided to demonstrate the materials meet the requirements of the Specifications.
    - a. Testing Laboratory: Submit certificates for laboratories (certified by the Washington State Department of Ecology) providing required testing to validate that the laboratory conforms to relevant paragraphs of ASTM D3740.
  6. Material Samples: The Contractor shall provide the Owner with a 2-gallon sample of material from each borrow source for visual inspection, except in cases where large rock is being imported. Each sample should be composited from no less than five subsamples taken throughout any one source. The Contractor shall ensure that the samples are representative of all materials to be imported. Samples shall be provided for the Owner at least 10 days before the materials represented by the samples are delivered to the site.
  7. Borrow Source Inspection: The borrow source for materials shall be inspected by the Contractor. During such inspection, the Contractor shall ensure that the materials to be delivered to the site are likely to meet the appropriate Specifications. The Contractor shall provide the Owner with 10 days' notice of such inspections. At the Owner's discretion, a representative may accompany the Contractor to witness such inspections. This witnessing shall in no way release the Contractor from complying with the Specifications and shall in no way be construed as approval of any particular source of material.
  8. Material Inspection: Truckloads of import material shall be visually inspected by the Contractor upon delivery. Materials shall be inspected for the presence of foreign, recycled, or reprocessed material. The Owner may perform an independent inspection of imported materials at any time. Material may be rejected by the Owner if identified as not standard or if test results show it to be substandard. Materials may be segregated for testing based on appearance or odor. Segregated materials may be tested according to designated procedures at the Owner's discretion.
  9. Layer-Thickness Verification: The Contractor shall include the means, methods, and procedures for ensuring the required lift thickness is met and that the material is placed within the horizontal and vertical extents as shown on the Drawings. The adequacy of the approved method will be verified in the field by the Owner. If, at any time during material placement activities, the approved method for thickness

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verification proves inadequate or unreliable in the opinion of the Owner, the Owner may designate or require development of an alternative method for thickness verification. The cost of the alternative method shall be borne by the Contractor, and no additional costs associated with thickness verification shall be paid by the Owner.

- a. The Owner may also elect to supplement the Contractor's methods through independent checks on layer extent and thickness to check and validate the Contractor's procedures and measurements, potentially including randomly located test excavations performed throughout the placement area.
10. Rejections: The Owner maintains the right to reject any materials determined to be substandard for any reason. In the event of rejections, it shall be the responsibility of the Contractor to remove all stockpiles of rejected material from the site.

### **1.03 TOLERANCES**

- A. The finished surface elevations and gap sizes shall not deviate from the lines and grades shown on the Drawings by more than the tolerances listed as follows. Tolerances are measured perpendicular to the indicated neatlines. Extreme limits of the tolerances given shall not be continuous in any direction by more than five times the nominal stone dimension for riprap, filter layer, and depth of foundation. For habitat gravel, the extreme limit of the tolerance is 2 linear feet along the neatline.

<b>Neatline Tolerances</b>		
<b>MATERIAL</b>	<b>ABOVE NEATLINE feet (inches)</b>	<b>BELOW NEATLINE feet (inches)</b>
Habitat gravel	0.25 (3.0)	0.0 (0.0)

- B. The intention is that the Work shall be built generally to the required elevations, slope, and grade and that the outer surfaces shall be even and present a neat appearance. Placed material not meeting these limits shall be removed or reworked as directed by the Owner or Owner's Representative. Payment will not be made for excess material that the Owner permits to remain in place.

## **PART 2 – PRODUCTS**

### **1.01 HABITAT GRAVEL**

- A. The habitat gravel mix will be naturally rounded gravel in accordance with the Project's Hydraulic Project Approval and meeting the following specifications:



**LUTHER BURBANK PARK WATERFRONT IMPROVEMENTS**  
**SECTION 35 42 00**  
**WATERWAY BANK PROTECTION**

<b>Sieve Size</b>	<b>Percent Passing (by Weight)</b>
1 to 1/2 inch	100
1 inch	85 to 95
3/4 inch	60 to 70
1/2 inch	35 to 45
1/4 inch	10 to 15
No. 4	2 to 7
No. 200	0 to 2

- B. The habitat gravel material to be placed will be a washed, naturally occurring round or subangular gravel, primarily (greater than 80%) igneous or metamorphic rock. Individual stones will be generally free of seams, cracks, and other defects that tend to destroy their resistance to weather. Rock material will be free of soil, clay balls, debris, wood, organic matter, and other extraneous material.

### **PART 3 – EXECUTION**

#### **3.01 PLACEMENT OF HABITAT GRAVEL**

- A. Follow general earthwork requirements set forth in Section 31 00 00 — Earthwork. Obtain Owner approval of subgrade prior to construction of the beach section. Place habitat gravel by a barge-mounted conveyor (Telebelt) or by offloading using a ramp and frontend loader and then spreading to the limits shown on the Drawings with a bulldozer, trackhoe, or other approved equipment. Work shall be done in the dry when Lake Washington is at its lowest level. All Work in the water shall comply with all permit requirements.

#### **3.02 RANGES, GAUGES, AND HORIZONTAL CONTROL**

- A. An accurate method of horizontal control shall be established by the Contractor before material placement begins. The proposed method and maintenance of the horizontal control system shall be subject to the approval of the Owner. If, at any time, the method fails to provide an accurate location for the placement operations, the Contractor shall be required to correct operations per the General Conditions.
- B. The Contractor shall lay out its Work from horizontal and vertical control points indicated on the Drawings and shall be responsible for all measurements taken from these points. The Contractor shall furnish all stakes, templates, platforms, equipment, range markers, transponder stations, and labor as may be required to lay out the Work from the control points shown on the Drawings. It shall be the responsibility of the Contractor to maintain all points established for the Work until authorized to remove them. If such points are destroyed by the Contractor or disturbed through its negligence prior to authorized removal, they shall be replaced by the Contractor at the Contractor's expense.

#### **END OF SECTION**

**SECTION 35 51 13  
FLOATING SPECIAL PURPOSE DOCK**

**PART 1 – GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. The work under this item includes all labor, engineering, materials, tools and equipment necessary to design, fabricate, pre-assemble, furnish and deliver the floating special purpose dock (float, floating dock). Layout and dimensions of the floating dock structures are shown on the Drawings.
- B. The float shall consist of an ADA compliant 60% open fiberglass reinforced plastic grated deck with non-slip surface, a corrosion resistant frame, corrosion resistant connection hardware, accessories such as cleats and/or bull rails as shown on the plans, and serviceable, corrosion resistant, and abrasion resistant pile restraint guide collars. The floating dock shall accommodate guide piles shown on the Drawings.
- C. The float manufacturer is responsible for final design based on design criteria, ADA requirements, regulatory permit conditions and these specifications. The provisions of the Contract, including the General conditions and information contained in the Drawings, apply to this work as if specified in this section.
- D. The work under this item also includes all labor, engineering, materials, tools and equipment necessary to refurbish the existing floating wood dock, including buoyancy revisions, replacing existing grating, replacing existing rubber rub strip, adding bullrail, hinged ADA compliant transition plates, and new bolt on pile hoops, as shown on the Drawings.

**1.02 RELATED WORK**

- A. Work related to this section:
  - 1. Section 05 50 00 – Metal Fabrications
  - 2. Section 06 74 13 – Fiberglass Reinforced Gratings
  - 3. Section 31 62 17 – Driven Steel Piles

**1.03 REFERENCES**

- A. The publications listed below form a part of this Specification to the extent referenced. References shall be the latest edition available as of the date of the invitation to bid unless otherwise specified.
  - 1. International Building Code (IBC) as amended by the State of Washington and the City of Mercer Island, Washington

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2. American Institute of Steel Construction (AISC)
  3. American Welding Society (AWS) D1.1 Structural Welding Code – Steel
  4. American Welding Society (AWS) D1.4 Structural Welding Code – Reinforcing Steel
  5. American Society of Testing and Materials (ASTM)
  6. American Society of Mechanical Engineers (ASME)
  7. UFC 4-152-07 "Small Craft Berthing Facilities".
  8. American Society of Civil Engineers, "Planning and Design Guidelines for Small Craft Harbors," ASCE Manuals and Reports on Engineering Practice No. 50.
  9. PIANC, "Review of Selected Standards for Floating Dock Designs," Supplement to Bulletin No. 93.
  10. Tobiasson & Kollmeyer, "Marinas and Small Craft Harbors," 1991.
  11. US Army Corps of Engineers. "Small Craft Harbors: Design, Construction and Operation," Special Report No. 2, December 1974.
  12. Aluminum Design Manual
  13. ADA Standards for Accessible Design (ADA), Department of Justice
  14. National Design Specification for Wood Construction (NDS)

#### **1.04 FLOAT SYSTEM PERFORMANCE REQUIREMENTS**

- A. Provide float units, and connections capable of withstanding design loading criteria indicated below:
  1. The Float shall be connected to the steel guide piles shown in the Drawings and shall be capable of supporting all design load combinations throughout entire range of lake levels.
  2. Freeboard:
    - a. Dead load freeboard: 12-inches of freeboard, maximum, at the new float. The existing floating wood dock freeboard shall be maintained.
    - b. Dead loads shall consist of the float systems, cleats, pile restraint guides, transition plates, grating, bull rails, aluminum framed ADA kayak launch, and all other attached appurtenances, etc. as shown on the Drawings
    - c. Under all dead loads, structural frames and connection hardware shall be greater than or equal to 8-inches above the water surface for the floating special purpose dock, and greater than or equal to 6-inches above the water surface for the existing floating wood dock.
  3. Wind Load:
    - a. Per the contract drawings.
  4. Uniform Live Load (ULL):
    - a. 20 psf uniform live load applied to the float.
    - b. Minimum freeboard under DL+ULL to be 4-inches minimum.
  5. Concentrated Live Load (CLL):

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- a. 400 lbs, acting over 6"x6" area, placed anywhere on floats, not closer than 12" from any edge.
    - b. Minimum freeboard under DL + CLL 6-inches minimum.
  - 6. Maximum Cross Slope
    - a. Under DL only, DL plus ULL, DL plus CLL, or DL plus ULL plus CLL: Shall not exceed 2% (1:50).
  - 7. Maximum Longitudinal Slope
    - a. Under DL only, and DL plus ULL: 1/8 inches per foot, not to exceed 1 inch in 10 feet.
    - b. Under DL and CLL: 1/4 inches per foot, not to exceed 2 inches in 10 feet.
  - 8. Wave Load: The float, connections from float to float and float to pile shall be designed to withstand the wave loads shown on the Drawings, applied along the edge of the float.
  - 9. Float-to-Guide Pile Connection: All float-to-guide pile connections shall be designed for the wave loading tributary to each pile, applied in any direction. Pile restraint guides shall have a removable portion such that the floats may be detached from the system.
  - 10. Lake Washington Water Levels (NAVD 88):
    - a. Ordinary High Water Mark (OHWM): EL 18.67
    - b. Ordinary Low Water Mark (OLWM): EL 16.75
- B. Float connections shall be designed to distribute loads based on the relative flexibility of the piling and dock assembly. Connections shall be noiseless and non-wearing. Selection preference will be given to the use of non-metallic flexible connection materials which will permit dampened vertical and torsional articulation without imposing concentrated or shock loads on the adjoining float units. Connection designs shall consider joint rotation effects so that contact, abrasion or subsequent damage between unprotected float elements does not occur due to wave and live load effects.
- C. Decking: Deck surface shall be ADA compliant FRP grating, nonslip and allow minimum 60% light penetration.
- D. The floating special purpose dock shall include an aluminum framed ADA kayak launching and retrieving ramp system, including but not limited to low friction rollers, grab bars, and cantilevered bench to aid in entering and exiting kayaks and other non-motorized vessels.

#### **1.05 FLOAT SYSTEM QUALITY ASSURANCE**

- A. The float manufacturer shall have a minimum of 5 years' experience in the design, manufacturing, and installation of the type of floats provided and shall have regularly engaged in the production of floating structures of the type required for this project. The float manufacturing facility shall provide proper environment, adequate workspace,

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- equipment, level construction surfaces, physical conditions and protection from direct sunlight, wind, moisture, and freezing necessary for construction of high-quality floats.
- B. All plans and calculations shall be signed and stamped with the seal of an Engineer registered in the State of Washington. The Engineer of Record for the float system shall have a minimum of 5 years' experience in the design of float structures.
- C. The float system shall be designed by the manufacturer in accordance with the latest IBC and shall consist of modular float units as required to provide the configuration shown on the drawings. Complete all engineering for the float system in accordance with plans and specified loads.
- D. Fabrications and connections shall be designed by the float manufacturer. Fabrications and associated connections to the floats shall be designed to develop the full capacity of the pertinent structural member connected. Steel transition plates shall meet the change in level requirements per current ADA standards.
- E. Steel pile locations shall be per the Drawings. Contractor shall field measure and determine exact final locations of piles to determine attachment locations of pile restraint guides.
- F. Pile restraint guides and method of attachment to the floats shall be designed by the manufacturer. Pile guides and connections to the float shall be designed to transmit all anticipated loads from the float to the piles without failure to the float, pile guides, and piles. This load shall not be less than the loading requirements described above. All directions of loading shall be considered.
- G. Float Tests and Inspection:
1. Quality control during the fabrication process shall be given utmost priority. A quality control plan shall be prepared prior to construction of any floats. A quality control supervisor shall be assigned to the project for the duration of the fabrication process. The supervisor will be responsible for insuring that all products are constructed per the plans and specifications. A checklist of contract conformance items shall be prepared and submitted to the Owner for each float produced. No floats may be produced in the absence of the quality control supervisor.
  2. The Contractor shall provide testing and field or plant inspection service to the satisfaction of the Design Professional. The Contractor shall hire an independent testing laboratory, as approved by the Owner, to provide on-site quality control services throughout the fabrication period. Sampling and testing shall be performed on-site or as otherwise approved by the Owner.
  3. At a minimum, the following sampling and testing procedures shall be performed:
    - a. All fillet welds shall be visually inspected.
    - b. All complete penetration welds shall be tested ultrasonically or by use of a comparable approved method.
- H. The plant facility shall be made available to the Design Professional for observation of the products. The Design Professional may perform structural observation at any point during

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the manufacturing of the float modules. The fabricator shall provide sufficient notice and access for the Design Professional to perform these observations.

- I. Welder Qualifications: All welders are required to be currently certified by AWS for structural welding. Contractor shall submit proof of certification in accordance with AWS. All welding shall be in accordance with the American Welding Society Structural Code – Steel, ANSI/AWS D1.1, current edition, or Aluminum ANSI/AWS D1.2, current edition. No welding shall be performed through paint, galvanized or other coatings.
- J. Metal Fabricator Qualifications: The metal fabricator shall have at least five (5) years continuous experience in the fabrication of the metal used.
- K. Timber treatment shall be applied by an organization regularly involved in the pressurized treatment of wood products.
- L. All floats shall be identified with the date of manufacture, float type and intended layout location designation per the approved shop drawings. Markings shall be located on one side and on one end for ease of field identification.
- M. For floats, the float manufacturer's quality control efforts shall include verification of material and treatment certificates against materials supplied before issuing them to the Design Professional. This may involve inspection of materials prior to treatment to determine species. The Contractor shall also provide documentation of verification of piece counts, sectional dimension and other random tolerance checks such as camber, sweep, crook, straightness, etc. The Contractor's quality control efforts shall also include provision of survey control to determine theoretical versus actual positions and elevations. The Design Professional shall undertake quality assurance observation, as deemed necessary.
- N. Provide a five-season warranty on materials and workmanship of the float system. A season is defined as March through October of any given year.

## **PART 2 – PRODUCTS**

### **2.01 FLOAT SYSTEM FABRICATION REQUIREMENTS**

- A. All structural bolts, including cleat and bull rail bolts, shall be through-bolted, unless noted otherwise on the plans, and shall be capable of developing their full allowable strength without causing damage to the float. Provide plate washers on all nut-bearing surfaces.
- B. Walking surfaces of the floats shall align with adjoining float units so that the articulating joints are free of tripping hazards and meeting current ADA standards throughout the defined water level ranges.
- C. Fire Protection and Life Safety Equipment as identified within the contract drawings are intended to be field installed to the deck of the floats via drilled-in-place bolts or other suitable means as determined by the float manufacturer. The float manufacturer shall consider means of connection in the float design to allow for ease of field installation.

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**2.02 FLOAT REQUIREMENTS**

**A. General**

1. Floats shall be fabricated in modules corresponding to the nominal length, widths, and geometric cross sections indicated on the plans. All forces and loads imposed on the float system shall be borne by the float structure.
2. The floats and associated connections shall be designed by the manufacturer. The accompanying plans indicate minimum requirements for the floats. The drawings are intended to indicate basic configuration and appearance criteria. Structural design of the float elements and its support connections is the responsibility of the manufacturer.
3. Pile locations shall be as shown on the drawings. Contractor shall field measure and determine exact final locations of piles to determine attachment locations of pile restraint guides.
4. Vendor may deviate from the plans to the extent required to facilitate structural connections and placement of pile restraint guides, to ensure the functionality of the desired product. Minor deviations for value engineering purposes may also be considered if it is in the best interest of the Owner. Submit all proposed deviations to the Design Professional for review and approval. Approved deviations shall be made at no additional cost to the Owner.

**B. Submittals: The float manufacturer shall furnish the following submittals for approval prior to fabrication:**

1. The float manufacturer shall submit qualifications demonstrating a minimum of 5 years' experience in the design, manufacturing and installation of the type of floats proposed. At a minimum, the manufacturer shall provide 5 project examples demonstrating this experience. The manufacturer shall also furnish resumes for their float design engineer and shop foreman or quality control specialist who will oversee the production of the floats. Both the engineer and shop foreman shall have experience demonstrating a minimum of 5 years in the design and manufacture of floating structures of the type proposed for this project.
2. The float manufacturer shall furnish engineered shop drawings and structural calculations, both stamped and signed by the Engineer of Record, with sufficient detail to satisfy requirements for permit. The Owner has applied for all regulatory permits required for the proposed work.
3. The float manufacturer shall provide calculations of the designed system demonstrating the required freeboard at time of construction and also calculations showing anticipated settlement due to foam absorption and other associated items.
4. The float manufacturer shall provide full-sized digital copies (minimum 22"x34") of all shop drawings for review by the Owner and Design Professional. Appropriate

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changes will be made as required by the markups and resubmitted to the Owner for final review and approval.

5. Shop drawings shall be submitted for all features of the float system including (but not limited to): Pile locations, float units, connection details and metal fabrications such as pile restraint guides, cleats, transition plates and associated hardware, bull rails and associated hardware, FRP grating, and the aluminum framed ADA kayak launch system, prior to fabrication.
6. Shop drawings shall contain sufficient detail and information to allow complete fabrication of the floats, pile restraint guides, transition plates and associated hardware, bull rails and associated hardware, FRP grating, and the aluminum framed ADA kayak launch system. The float manufacturer shall furnish catalog cuts of any proprietary items to the Design Professional for approval.
7. Completed float products shall be weighed in order to verify flotation calculations.
8. The float manufacturer shall submit a quality control plan and testing results for review by the Owner.

C. Materials

1. Aluminum:
  - a. All aluminum and aluminum fabrication, including but not limited to pontoons and framing, shall be heavy duty marine grade 5086 aluminum alloy.
2. Timber Components
  - a. All timber components shall be Douglas Fir No. 1 or better, in accordance with WCLIB inspection rules. All timber components shall not have splits, warps or waness. Surfacing shall be S4S, chamfered or milled as noted on the plans.
  - b. In addition to complying with all applicable codes and regulations, all materials of this section shall comply with the pertinent provisions of the following:
    - 1) "West Coast Lumber Inspection Bureau, Rule Book 16" for Douglas Fir.
    - 2) "Construction and Industrial Softwood Plywood" Product Standard PS 1-83 of U.S. Department of Commerce.
    - 3) "Specification for the Design, Fabrication, and Erection of Structural Steel for Building" of the AISC, for rough hardware.
    - 4) Timber shall be preservative treated per the Drawings. Preservative treatments shall meet all current best management practices. - Best Management Practices for the Use of Preserved Wood in Aquatic and Sensitive Environments (BMPs).
    - 5) All timber shall be cut to length, drilled, dapped, and chamfered prior to pressure treatment.
    - 6) All accidental field cuts, nicks, abrasions, or punctures shall be thoroughly saturated in the field, in accordance with AWPAM4, with one of the following preservative products:



- a) Copper Napthenate
  - b) Solubilized Copper-8-Quinolinolate
- 7) Lumber shall be fabricated to provide uniform gaps and butt joint connections. Lumber splices shall not exceed ½ inch between adjoining ends. All decking, spacers, plywood, or any other member which is subject to foot traffic, shall be flush with the walking surface.
- 8) All exposed timber corners shall be chamfered by ½-inch.
- 3. Plastic Lumber
  - a. Plastic lumber shall be a purified high-density polyethylene (HDPE) material made from 100% recycled plastic, in accordance with ASTM D-6662. The material shall be of uniform color, color stabilized, and shall be resistant to ultra-violet deterioration, mechanical abrasion, chemical attack, detergents, and animals. The plastic lumber material shall be procured in 8-foot lengths, minimum. The material shall also be suitable for long-term exterior exposure. Color shall match the furnished float material or as approved by the owner.
- 4. Structural and Misc. Steel
  - a. All structural steel and structural steel fabrication, including but not limited to, pile guides, plates, and shapes shall be in accordance with ASTM A-36 or ASTM A-572. Pipe sections shall be in accordance with ASTM A-53, Type E or S, Grade B. Cold formed hollow structural sections shall be in accordance with ASTM A-500, Grade B. All steel fabrications and components shall be hot-dipped galvanized in accordance with ASTM A-123. Touch up galvanizing shall be in accordance with ASTM A-780, hot-stick repair using zinc-based alloys.
  - b. Fasteners for timber members: Bolts shall conform to ASTM A-307 or A-36 as applicable, with ASTM A-563 hex nuts and flat washers. Malleable iron washers are required in all cases (except economy head bolts) where the bolt heads or nuts would otherwise bear directly on wood. Locking nuts shall be heavy hex head and self-locking type. Wood screws shall conform to ASME B18.6.1. Lag bolts shall conform to ASME B18.2.1. All bolts, lag bolts, wood screws, nuts, washers, etc. shall be hot-dipped galvanized in accordance with ASTM A-153. Touch up galvanizing shall be in accordance with ASTM A-780, hot-stick repair using zinc-based alloys.
  - c. Bolts for float connections and metal fabrications shall be ASTM A-325 and shall be hot dip galvanized after fabrication in accordance with ASTM A-153.
  - d. All bolts and lag bolts shall be a minimum of 5/8" diameter. Where dissimilar metals come into contact, provide durable plastic (HDPE or UHMW) isolating bushings or washers.
  - e. All steel shall have 3/8" minimum thickness unless noted otherwise.
  - f. All holes shall be drilled or punched 1/16-inch larger than the connecting bolt diameter. Do not flame cut holes.

- 
- g. Design, fabrication and erection shall be in accordance with the "AISC Code of Standard Practice for Steel Buildings and Bridges, Current Edition".
  - h. All welding shall conform to the AWS codes for arc and gas welding in building construction. Welding shall be performed in accordance with a welding procedure specification (WPS) as required in AWS D1.1 and approved by the structural engineer. The WPS variables shall be within the parameters established by the filler-metal manufacturer. Welds shall be made using E70XX electrodes and shall be 3/16-inch minimum. Welding shall be by AWS certified welders.
  - i. Vessel mooring cleats shall Sea Dog galvanized iron hex head closed base dock cleats, or approved equal, with a minimum capacity each of 10 tons. The castings shall conform to the requirements of the Standard Specifications for Ductile Iron Castings, ASTM Designation A-27, Grade 60-30, with the exception that the elongation requirements shall be waived. Cleat bolts shall be recessed and mounted flush with the top surface of the cleat. Not less than two, 5/8-inch diameter hex head bolts shall be used to secure each cleat. Cleats shall be hot-dipped galvanized in accordance with ASTM A-123.
5. Rubber Components
- a. Rubber components shall be butyl rubber (ASTM D-2000-75E Type BA) or neoprene (ASTM D-2000-75E Type BC) with Shore A durometer hardness of 45 to 55.
6. Fiberglass Grating
- a. See Section 06 74 13 - Fiberglass Reinforced Gratings.
- D. Other Materials
- 1. All other materials not specifically described but required for a complete and proper installation of the work shall be as selected by the float manufacturer subject to the approval of the Design Professional.

## **PART 3 – EXECUTION**

### **3.01 FLOAT HANDLING AND DELIVERY REQUIREMENTS**

- A. Floats shall be properly designed for loading, shipment, stacking and storage. Pre-assembled float units shall be designed to be top lifted to facilitate barge loading and placement into the water at the project site. The design shall incorporate structural elements or attachment points by which the floats may be safely lifted without damage to the float structure or flotation. Lifting of the float modules by straps placed underneath exposed or inadequately protected rigid float shells will be strictly prohibited. The

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manufacturer shall provide written instructions and diagrams which indicate acceptable lifting, stacking and storage procedures.

**3.02 INSTALLATION SUPPORT REQUIREMENTS**

- A. The float manufacturer shall provide a representative knowledgeable with the installation of floats, on site for a minimum of three site visits as follows: (Note: half-day shall be defined as a 4-hour workday, Monday through Friday, at the project site, and shall not include travel time.)
- B. One, half-day duration site visit prior to installation, to discuss float installation procedures and requirements with the installation contractor and Owner Representative(s).
- C. One, half-day duration site visit during installation to verify required installation procedures are being followed.
- D. One, half-day duration site visit during installation punch-list review to assist in identification of any potential deficiencies, defects, etc.
- E. The Design Professional will schedule the dates of each site visit at mutually agreed upon times after the installation contractor's schedule is known.

**END OF SECTION**

## **APPENDIX**

- **Luther Burbank Park Dock Geotechnical Report**
- **Luther Burbank Park Upland Shoreline Improvements Geotechnical Report**
- **Dive Survey – Field Notes**

## **Geotechnical Engineering Services**

Luther Burbank Park Dock Repair  
Mercer Island, Washington

*for*  
**KPFF Consulting Engineers**

June 30, 2022



**GEOENGINEERS**   
Earth Science + Technology

## **Geotechnical Engineering Services**

Luther Burbank Park Dock Repair  
Mercer Island, Washington

*for*

**KPFF Consulting Engineers**

June 30, 2022



1101 South Fawcett Avenue, Suite 200  
Tacoma, Washington 98402  
253.383.4940

# Geotechnical Engineering Services

## Luther Burbank Park Dock Repair Mercer Island, Washington

File No. 0817-024-02

June 30, 2022

Prepared for:

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Appendix A. Referenced Exploration Logs

Appendix B. Report Limitations and Guidelines for use



## **1.0 INTRODUCTION AND PROJECT UNDERSTANDING**

This report presents the results of our geotechnical engineering services for the Luther Burbank Park Dock Repair project. The project site is located at 2040 84<sup>th</sup> Avenue SE in Mercer Island, Washington. Our understanding of the project is based on our communications with Andrew Bennett (KPFF Consulting Engineers [KPFF]) and information provided including the 60 percent dock improvement plans dated June 13, 2022 and the plans for the original dock dated April 26, 1973 (1973 Plans).

We understand that portions of the existing moorage pier and floating docks at the park will be removed, and new floating dock segments secured in place using driven piles will be installed. We understand that 24-inch and 16-inch diameter steel pipe piles will be used to secure the docks. In addition to the dock improvements, a new overwater staircase is proposed along the existing shoreline bulkhead. We understand that the existing bulkhead will not be substantially modified as part of installing the overwater stairs and new docks. We understand that the staircase will be supported on either 6- to 8-inch diameter steel pipe piles.

Onshore improvements around the existing boiler plant building are also proposed at the site. GeoEngineers prepared a draft geotechnical report (dated April 26, 2022) to support the onshore improvements. These services are being provided under a separate contract with the City of Mercer Island.

## **2.0 SCOPE OF SERVICES**

The purpose of our services was to review available existing subsurface information and complete hand-tool explorations at the site as a basis for providing geotechnical recommendations for design and construction. Our services were completed in accordance with our signed agreement dated May 26, 2020 and amended on June 1, 2022. Our specific scope of services is summarized in our proposal dated March 23, 2020.

## **3.0 SITE CONDITIONS**

### **3.1. Surface Conditions**

The project site is located on the shoreline of Lake Washington approximately in the geographical center of the parks' shoreline frontage. In the area of the dock the upland shoreline is developed with a concrete and brick sidewalk and a historic brick boiler plant building that has been converted into a restroom and park equipment storage area. An approximately 200-foot-long concrete bulkhead is located along the shoreline in front of the boiler plant.

The existing floating docks and moorage pier are accessed via the bulkhead area and extend approximately 250 feet out from the shoreline. The pier is supported on timber piles with top diameters on the order of 12 inches and butt diameters on the order of 8 inches as indicated in the 1973 plans.

## **3.2. Subsurface Conditions**

### **3.2.1. Literature Review**

We reviewed the Geologic Map of King County (2007). According to the map the project site is underlain by glacial till (Qvt). Glacial till is typically comprised of a mixture of sand, gravel, and cobbles in a silt matrix. Glacial till soils were consolidated by the weight of the overriding glacier and are typically dense to very dense.

The 1973 plans included data from four test piles driven as part of the pier construction. The test piles were embedded between 15 and 17 feet below mudline using a 3,450 pound drop hammer. End of drive blow counts for the test piles ranged between 10 and 16 blows per foot. The 1973 plans indicate that the soils encountered during the test pile program were interpreted to be “blue clay and cemented glacial till...”

We also reviewed the subsurface exploration logs completed to support the onshore improvements project. The locations of these explorations are shown on the Site Plan, Figure 1 and the exploration logs are included in Appendix A for reference. In these explorations very dense glacial till was encountered starting within about 1 foot of the ground surface with the exception of B-3, which was advanced in the vicinity of a relic underground storage tank. In B-3 about 7 feet of fill associated with the tank was observed on top of very dense glacially consolidated soils.

### **3.2.2. Subsurface Explorations**

As part of our study, we advanced three dynamic cone penetrometer (DCP) test explorations from the existing pier. The locations of the DCP explorations are shown on the Site Plan, Figure 2. The DCP explorations extended between 2 and 2½ feet below mudline. No soil samples are obtained during DCP testing, therefore, our understanding of subsurface conditions in the offshore area of the site is based on the measured DCP penetration rates, reviewed information, and our experience.

### **3.2.3. Subsurface Conditions**

Measured water depths ranged from about 14 feet to 24 feet at the locations of our DCP explorations.

The DCP explorations extended 2 to 2½ feet below mudline. Plots of the estimated Standard Penetration Test (SPT) “N” value versus depths for each DCP exploration is shown on Figure 3. The SPT values presented are based on published correlations between DCP penetration rate and SPT N values.

Based on the measured driving resistance, our observations, and our understanding of the site geology we encountered what we interpret to be lake sediments underlain by weathered glacially consolidated soil in our DCPs. The thickness of the lake sediments at the DCP locations appears to be on the order of 1 to 2 feet. The lake sediments were penetrated with the tip of the DCP under the weight of the rods (zero blow counts) or with a few blows of the DCP drop hammer. We expect the lake soils likely consist of a mixture of soft organic material, loose sand, and soft silt. The thickness of the lake sediments are expected to vary across the site. Due to the relative steepness of the lakebed in the project area, it appears unlikely that thick layers of lake sediments would collect with the project boundaries, however small depressions in the lakebed could locally collect more loose sediments than other steeper areas. To account for the uncertainty in the thickness of this layer, we recommend assuming that there is at least a 5-foot layer of lake sediments when designing the piles. In our opinion this is conservative with regards to piles design and prudent, given then limited explorations completed for this study.

DCP penetration resistance generally increased with depth when the weathered glacially consolidated soils were encountered. We expect that these soils are comprised of medium dense to dense soil similar to the glacially consolidated soils observe in the upland areas. We expect that the weathered zone of the glacially consolidated soils is on the order of 5 to 10 feet thick and is underlain by intact glacially consolidated soil.

## 4.0 CONCLUSIONS AND RECOMMENDATIONS

### 4.1. Seismic Design

#### 4.1.1. Seismic Design Parameters

The table below provides seismic design parameters developed in accordance the 2018 International Building Code (IBC) which references American Society of Civil Engineers (ASCE) 7-16. The project site is underlain by dense to very dense glacially consolidated soils and we recommend using a response spectrum for Site Class C for this site.

**TABLE 1. SEISMIC DESIGN PARAMETERS 2018 IBC**

2018 IBC Seismic Design Parameters	
Spectral Response Acceleration at Short Periods ( $S_s$ )	1.388g
Spectral Response Acceleration at 1-Second Periods ( $S_1$ )	0.482g
Site Class	C
Site Modified Peak Ground Acceleration ( $PGA_M$ )	0.712g
Design Spectral Response Acceleration at Short Periods ( $SD_s$ )	1.11g
Design Spectral Response Acceleration at 1-Second Periods ( $SD_1$ )	0.483g

#### 4.1.2. Liquefaction, Lateral Spreading and Surface Rupture

Liquefaction refers to a condition where vibration or shaking of the ground, usually from earthquake forces, results in development of excess pore pressures and subsequent loss of strength in the affected soil deposit. In general, soils that are susceptible to liquefaction include loose to medium dense “clean” to silty sands that are below the water table.

Based on the soil conditions observed in our explorations and our understanding of the site geology, in our opinion it is unlikely that there are potentially liquefiable soils present at the project site and there is a low risk of significant liquefaction occurring during the seismic design event.

Lateral spreading related to seismic activity typically involves lateral displacement of large, surficial blocks of non-liquefied soil when an underlying soil layer loses strength during seismic shaking. Lateral spreading usually develops in areas where sloping ground or large grade changes (including retaining walls) are present. Due to the low liquefaction risk at the site, in our opinion there is also a low risk of lateral spreading occurring at this site.

According to the Department of Natural Resources Seismic Hazards Map, the project site is in the vicinity of the Seattle Fault zone. However, because bedrock in this area is covered by hundreds of feet of glacial soils, it is unlikely that movement of the fault would result in significant surface rupture at the ground surface.

## 4.2. Dock Piles

### 4.2.1. General

Based on information provided by KPFF, 24-inch diameter by 0.625 inch wall (24 x 0.625 -inch) and 16 x 0.625-inch wall open ended steel pipe piles will be installed to secure the new docks. We understand that the 24-inch diameter piles will be embedded around 28 feet below mudline and the 16-inch diameter piles will be installed around 20 feet below mudline. Design and construction recommendations for the dock piles are provided in the sections below.

### 4.2.2. Soil Properties for Lateral Pile Analysis

We understand that KPFF will be evaluating lateral pile performance using the software program LPILE (Ensoft 2016). We recommend that the soil profile and properties in Table 2 be used for static evaluation of the piles. We expect that some strain softening of the site soils could occur during seismic shaking, however strain softening is expected to be negligible within the glacially consolidated soil units. In our opinion the static parameters presented below can also be used for evaluating pseudo-static conditions. If piles are spaced at least six pile diameters on center, no reduction of lateral capacity for group action is needed.

Due to the uncertainty of the subsurface profile at the site we recommend evaluating a range of contacts between the units to establish a critical or controlling case.

**TABLE 2. SOIL PROPERTIES FOR LATERAL PILE ANALYSES**

Soil Unit	Anticipated Top of Unit (feet below mudline)	Anticipated Bottom of Unit (feet below mudline)	LPile Soil Type	Effective Unit Weight (pcf)	Friction Angle ( $\phi$ ) or Cohesion (c)	Stiffness (K) or Strain Factor (E50)
Lake Sediments	Mudline	5	Soft Clay (Matlock)	58	c = 200 psf	E50 = 20
Weathered Glacially Consolidated Soils	5	10	Sand (Reese)	63	$\phi = 32^\circ$	K= 100 pci
Glacially Consolidated Soil	10	Extent of analysis	Sand (Reese)	68	$\phi = 38^\circ$	K= 125 pci

### 4.2.3. Axial Pile Resistance

Figure 4 and Figure 5 present our estimate of ultimate and allowable pile axial pile resistance for the 16-inch and 24-inch diameter open ended pipe piles, respectively. The provided axial resistances are based on unplugged soil conditions, which in our opinion, is conservative with regards to pile design. The allowable resistances include a minimum factor of safety of about 1.5 for side friction and end bearing, and 2.0 for uplift. The allowable resistances apply to single piles. If piles are spaced at least three pile diameters on center, no reduction of axial capacity for group action is needed.

We expect that axial loads on the dock piles will be relatively modest and that the piles will achieve the needed allowable resistances at shallow embedment depths into the glacially consolidated soils. Additional

embedment into the glacially consolidated soils beyond what is needed for axial resistance will likely be required for lateral fixity. This will necessitate overdriving the piles to achieve the minimum pile tip elevations. The additional driving could produce a soil plug in the tip of the pile, further increasing the driving resistance. Table 3 provides an estimate of pile overdrive resistance at the anticipated pile embedment depths provided by KPFF. The reported overdrive resistances in Table 3 are ultimate resistances that could occur and are provided for reference and evaluating pile installation. The overdrive resistances should not be used for design of the piles.

**TABLE 3: ESTIMATED PILE OVERDRIVE RESISTANCE**

Pile Size	Pile Embedment Depth (feet below mudline)	Anticipated Total Overdrive Resistance
24" x 0.625"	28	Unplugged: 160 kips Plugged: 850 kips
16" x 0.625"	20	Unplugged: 70 kips Plugged: 330 kips

#### **4.2.4. Pile Installation Considerations**

##### **4.2.4.1. Anticipated Driving Conditions and Hammer Selection**

We expect that soft or loose lake deposit soils will be present near the mudline at the start of driving and that driving resistance will rapidly increase as the piles encounter and are driven into the glacially consolidated soils. Zones of coarse gravels and cobbles should be expected. Boulders, if encountered, may obstruct the installation of piles in the planned location. If a boulder is encountered at depth, it may be necessary to use a sacrificial reinforced H-pile or other pile as a "spud" in an attempt to move or break up the boulder before advancing the production pile. Alternatively, relocating the proposed pile may need to be considered. The contractor performing the work should be made aware of the anticipated driving conditions and should be prepared to deal with these conditions during construction.

We anticipate that a vibratory hammer will be the preferred installation method for the piles. However, based on the soil conditions at the site and our experience we anticipate that a combination of vibratory and impact driving could be required to achieve required embedment depths. Alternatively, the pile could be driven using an impact hammer only.

Advancing piles into glacially consolidated soils with a vibratory hammer can be difficult. Based on our experience we expect that a vibratory hammer could be capable of installing the open-ended steel pipe piles about 10 to 20 feet into glacially consolidated soils. The actual embedment depth that can be achieved with a vibratory hammer will depend on the size of the hammer used, the length of the pile and the subsurface conditions encountered at the installation location.

The size of vibratory hammer required to install the pile will depend on the length of the pile and the conditions encountered. To advance the pile, vibratory hammers must mobilize or "excite" the mass of the hammer-pile combination. The heavier the hammer-pile combination, the more energy required to excite the system. A rough estimate of the minimum vibratory hammer size required to vibrate the pile-hammer combination can be made using the American Pile Driving Equipment (APE) Amplitude Equation. The amplitude equation is a relatively simple calculation and does not consider embedment depth, soil conditions or pile type (i.e., open ended or closed ended). Based on our calculations using the amplitude equation we expect that at least an APE 50 (eccentric moment = 1,300 in-lbs.) would be necessary to

vibrate a 50-foot-long, 24- x 0.625-inch pipe pile. However, given anticipated soil conditions, a larger vibratory hammer would likely be necessary to advance the piles a significant distance into the glacially consolidated soils. The APE 200 hammer (eccentric moment = 4,400 in-lbs) is commonly used in the region to install steel pipe piles into glacially consolidated soils. We expect that a hammer of this size is more appropriately sized for driving the 24-inch diameter piles, but may be oversized, and could damage the 16-inch diameter piles during driving. Pile damage during vibratory installation typically occurs at the top of the pile and can be remedied by removing or “fresh heading” the damaged section after installation.

If a vibratory hammer is not capable of installing the pile to the design embedment depth, use of an impact hammer will likely be necessary. Similarly, if a soil plug were to form during installation, we expect that a vibratory hammer may not be capable of installing the pile. In our experience the 16- and 24- inch-diameter are at a relatively high risk of plugging, especially during impact driving.

We completed a preliminary pile drivability analysis using the software program GRLWEAP to evaluate minimum impact hammer sizes that will likely be necessary to install the envisioned piles. Considering the range of overdrive resistances presented in Table 3, we anticipate that an impact hammer with a minimum rated energy between 60 and 80 kip-feet will likely be suitable for installing the 24-inch diameter piles and an impact hammer with a minimum rated energy between 30 and 50 kip-feet will likely be suitable for installing the 16-inch diameter piles. Note that these are minimum hammer energy ranges. Larger hammers than what are estimated for each piles’ size could also be acceptable, however pile driving stresses will need to be evaluated to determine if larger hammers will damage the piles during installation. Two different sized hammers, or a single hammer with variable energy settings, could be required for pile installation on the project.

Ultimately, the hammers used to install the piles should be evaluated and selected by the contractor performing the work. We recommend that the contractor performing the work submit a pile installation plan, which at a minimum should include:

- A proposed vibratory hammer size.
- A proposed impact hammer size and a pile drivability analysis considering the hammer-pile driving configuration. The pile drivability analysis should evaluate the driving stresses that could occur during installation and the calculated driving stresses from the drivability analysis should be compared to the allowable driving stresses for the pile. Typically, driving stresses in steel piles should be limited to 90 percent of the steel yield strength. Ultimately, anticipated pile driving stresses should be reviewed by a structural engineer.
- A contingency plan for advancing the pile to the design embedment depth if refusal with a vibratory hammer is encountered.
- A plan for advancing piles through zones of coarse gravels and cobbles, and a proposed plan for dealing with boulders, should they be encountered.

#### **4.2.4.2. Additional Considerations**

An approximation of axial pile capacity can be made during impact driving by monitoring hammer blows versus penetration distance and observing hammer stroke height. It is not possible to accurately correlate pile capacity to penetration rate when piles are installed using vibratory hammers. Often, piles installed using a vibratory hammer will be “proofed” using an impact hammer once the pile is near or at the design

tip elevation in order to approximate pile capacity. In our opinion this pile proofing is not necessary if the minimum pile embedment depth is controlled by lateral loading. We recommend that we be allowed to review the design pile embedment depth and loads once they are finalized so we can provide a final recommendation on the need for pile axial capacity verification.

### 4.3. Overwater Staircase Piles

#### 4.3.1. Axial Resistance

We understand that 6-inch to 8-inch diameter steel pipe piles will be used to support the proposed overwater staircase. Smaller diameter piles are often installed using pneumatic impact hammers that can mounted to excavators.

Table 4 below provides recommended allowable pile resistances for 6- and 8-inch-diameter piles. The allowable resistances include a factor of safety of around 2. Typically, small diameter piles driven to a specified penetration rate that corresponds to an estimated allowable pile resistance. The estimated penetration rates that correspond to the provided pile resistances are also provided in Table 3.

**TABLE 4. PILE AXIAL RESISTANCE**

<b>Pile Diameter (D) and Wall Thickness (T)</b>	<b>Allowable Pile Resistance (kips)</b>	<b>Pile Penetration Rate at Allowable Pile Resistance 2,000 lb. hammer</b>	<b>Pile Penetration Rate at Allowable Pile Resistance 3,000 lb. hammer</b>	<b>Pile Penetration Rate at Allowable Pile Resistance 5,000 lb. hammer</b>
D = 6 inches T = 0.28 inches	15	10	6 sec/in	4 sec/in
D = 8 inches T = 0.322 inches	25	Larger hammer recommended	10 sec/in	8 sec/in

#### 4.3.2. Lateral Pile Analysis

In our opinion the LPILE parameters provided previously for the dock piles are also appropriate for evaluating the overwater staircase piles. For 6-inch and 8-inch diameter piles, lateral group effects do not need to be considered for piles spaced more than six diameters apart (center-to-center) in the direction of loading. We should be notified if piles will be spaced closer than six diameters apart and can provide recommendations for appropriate P-Multipliers, if requested.

#### 4.3.3. Pile Installation Considerations

We recommend that the piles be embedded at least 5 feet into intact glacially consolidated soils. Ultimately, the target pile embedment depth should be determined based on the results of the lateral pile analysis and the penetration rates observed during pile installation.

We expect that soft or loose lake deposit soils will be present near the mudline at the start of driving and that driving resistance will rapidly increase as the piles encounter and are driven into the glacially consolidated soils. Zones of coarse gravels and cobbles should be expected within the glacially consolidated soils. Boulders, if encountered, may obstruct the installation of piles in the planned location. If a boulder is encountered at depth, it may be necessary to use a sacrificial pile to move or break up the boulder before advancing the production pile. Alternatively, relocating the proposed pile may need to be



considered. The contractor performing the work should be made aware of the anticipated driving conditions and should be prepared to deal with these conditions during construction.

The contractor performing the work should be made responsible for selecting the hammer and equipment necessary to install the piles. We recommend that the contractor submit a pile installation plan, which at a minimum should include:

- Proposed hammer type and size;
- Pile driving refusal criteria; and
- A plan for advancing piles through zones of coarse gravels and cobbles, and a proposed plan for dealing with boulders, should they be encountered.

In our experience, to make material transportation and handling easier, smaller diameter piles are typically installed in 20-foot sections that are connected using a compression coupler. If a compression coupler system is used, the connection points should also be welded.

Because the piles will be installed into soils that contain gravels and cobbles, we recommend that the piles be constructed using high strength steel. Even if the piles are constructed of high strength steel, the small diameter piles will have relatively thin walls that can be damaged when driven into coarse-grained soils. In our opinion piles with a wall thickness less than about  $\frac{1}{4}$  inch have a relatively high risk of damage during installation and piles with a wall thickness greater than  $\frac{3}{8}$  inch have a lower risk of damage during installation.

## 5.0 LIMITATIONS

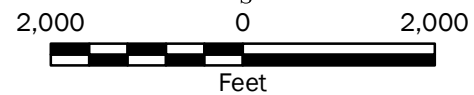
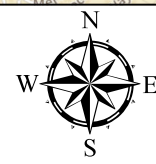
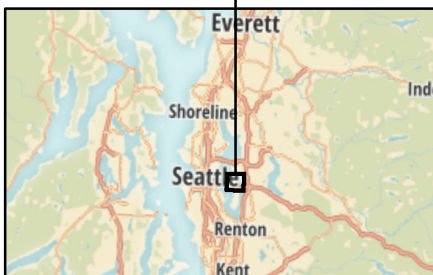
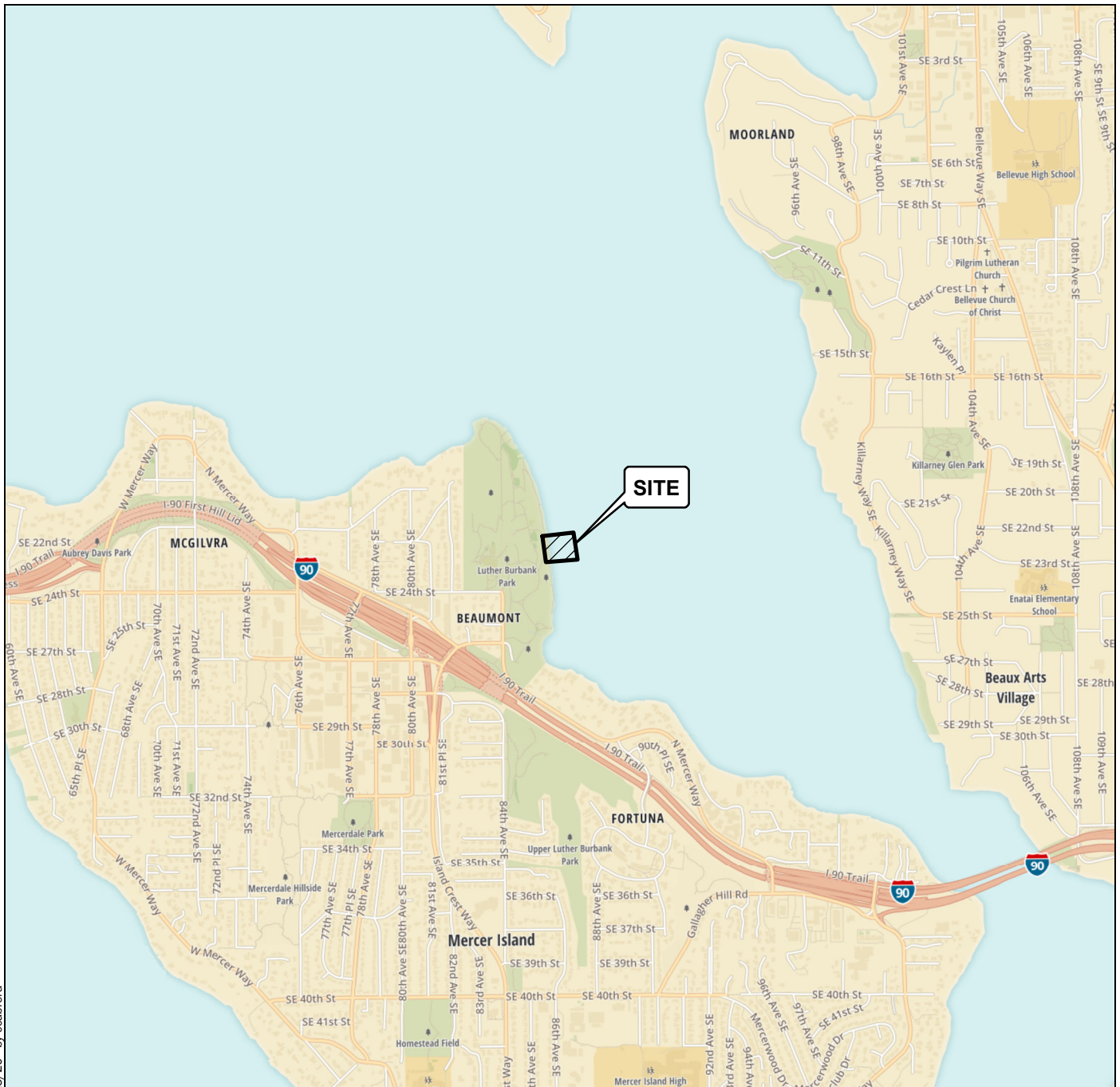
We have prepared this report for KPFF Consulting Engineers, for the Luther Burbank Park Dock Repair Project. KPFF may distribute copies of this report to owner and owner's authorized agents and regulatory agencies as may be required for the Project.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices for geotechnical engineering in this area at the time this report was prepared. The conclusions, recommendations, and opinions presented in this report are based on our professional knowledge, judgment and experience. No warranty, express or implied, applies to the services or this report.

Please refer to Appendix B titled "Report Limitations and Guidelines for Use" for additional information pertaining to use of this report.







### Vicinity Map

Luther Burbank Park Dock Repair  
Mercer Island, Washington



Figure 1

### 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: Mapbox Open Street Map, 2016



Projection: NAD 1983 UTM Zone 10N



\\geoengineers.com\WAN\Projects\0817024\CAD\00\Geotech Report\081702400\_F02\_Site Plan.dwg TAB:F02 Date Exported: 06/09/22 - 13:58 by tbyrd



#### Legend

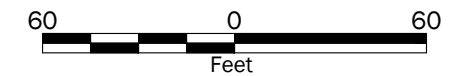
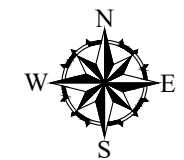
- B-1  Boring by GeoEngineers, Inc., 2022
- DCP-1  DCP Location by GeoEngineers, Inc., 2020

#### 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: Aerial from Google Earth Pro dated 08/14/2020.

Projection: Washington State Plane, North Zone, NAD83, US Foot



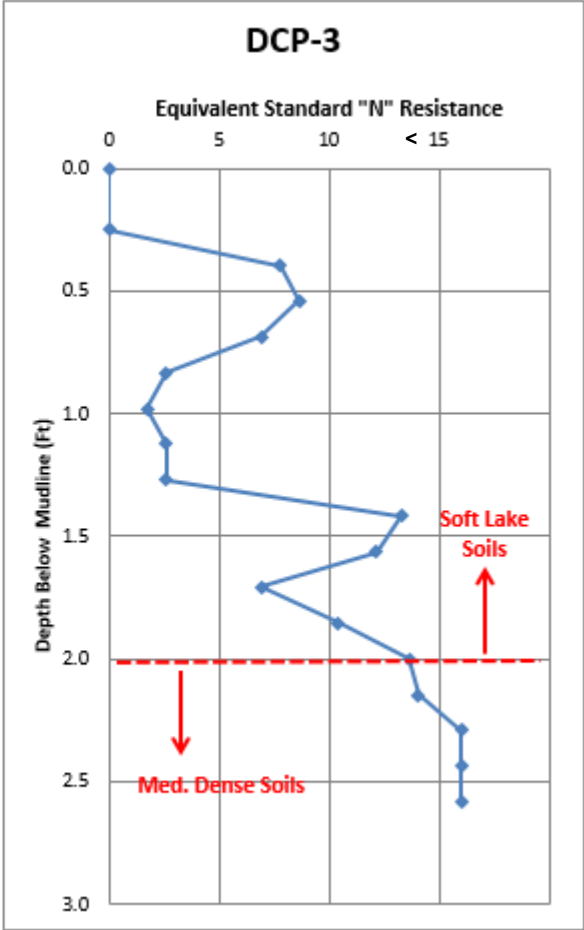
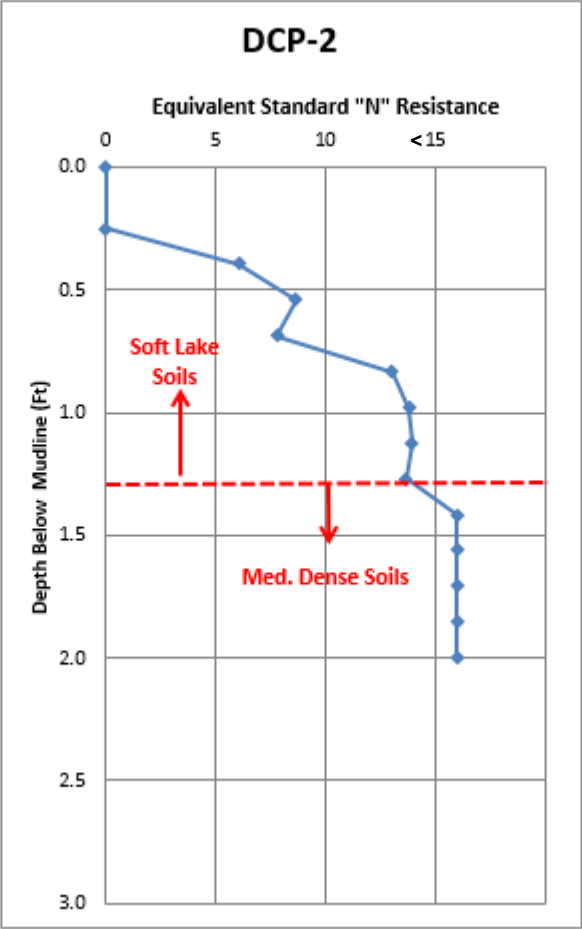
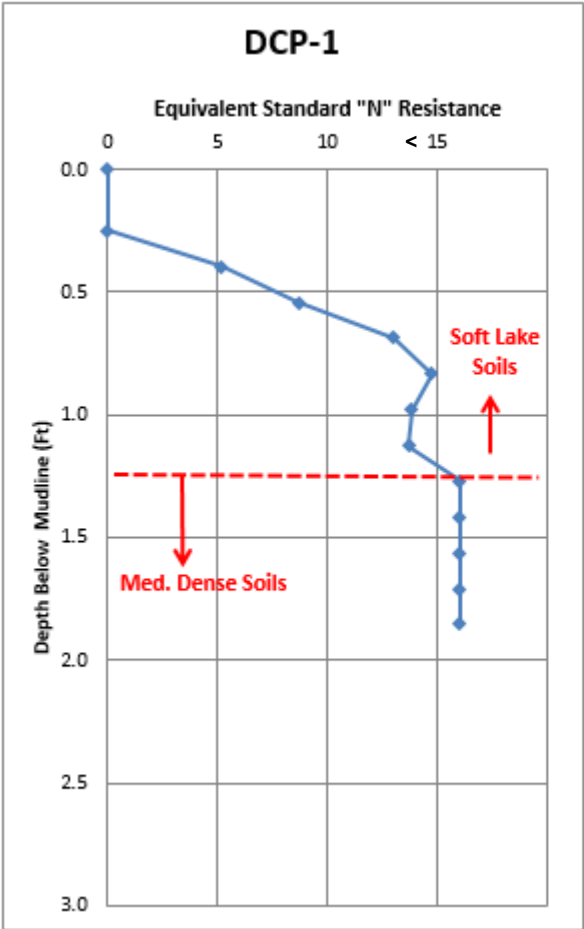
#### Site Plan

Luther Burbank Park Upland Improvements  
Mercer Island Washington



Figure 2





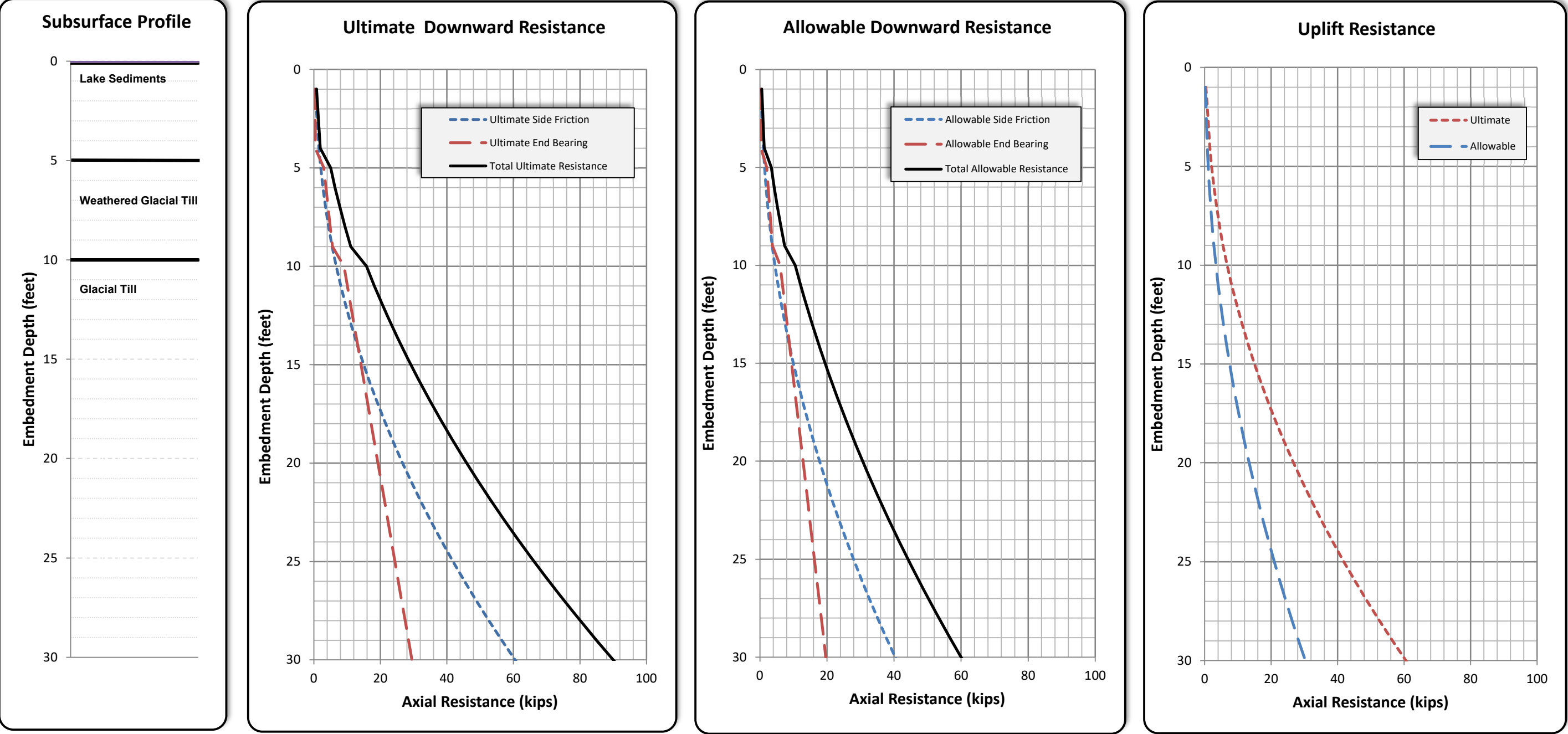
**DCP Logs**

Luther Burbank Park Dock Repair  
Mercer Island, Washington

**GEOENGINEERS**

**Figure 3**

AXIAL PILE RESISTANCE  
16 x 0.625-inch Open-End Steel Pipe Pile



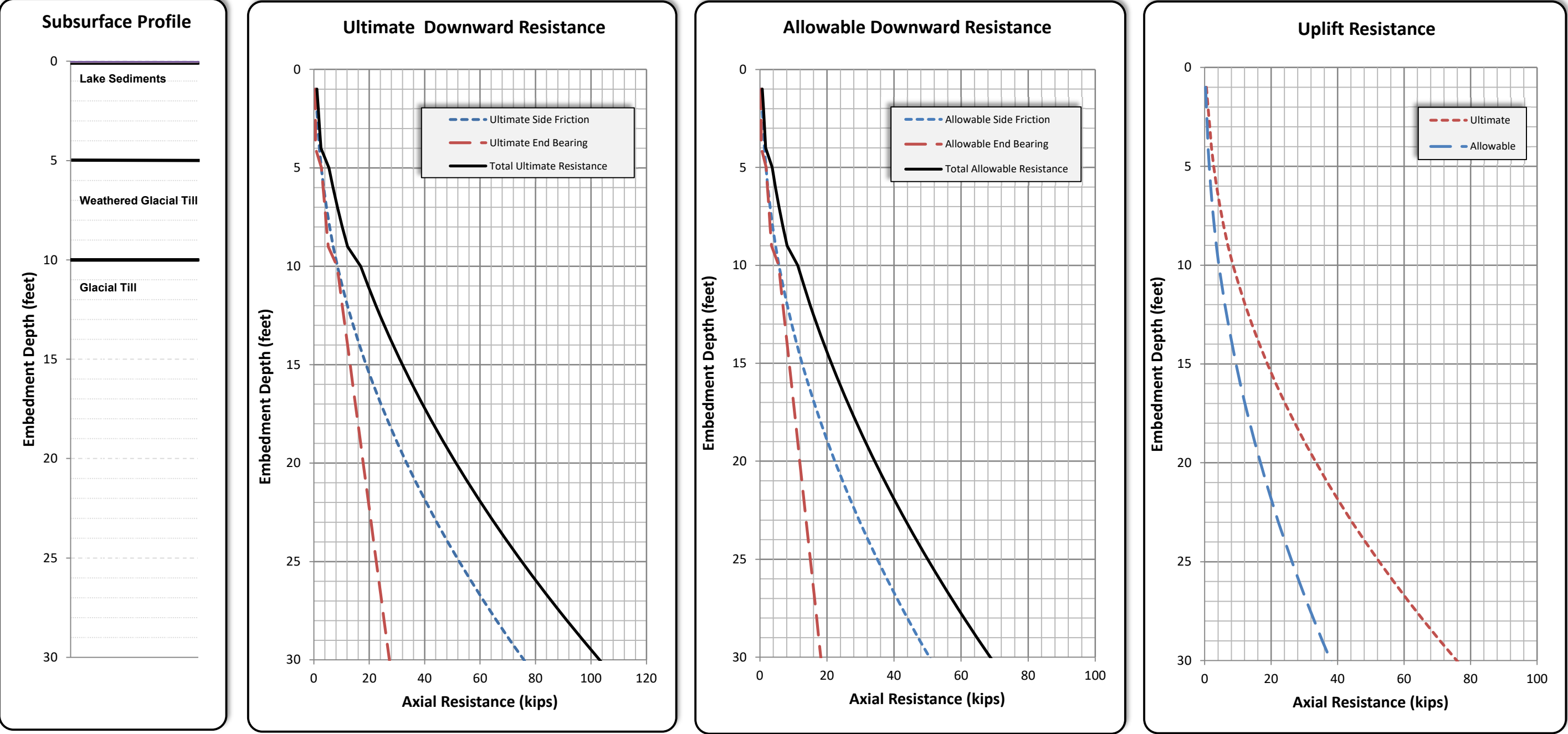
Axial Pile Resistance

Luther Burbank Park Dock Repair  
Mercer Island, Washington



Figure 4

AXIAL PILE RESISTANCE  
24 x 0.625-inch Open-End Steel Pipe Pile



Axial Pile Resistance

Luther Burbank Park Dock Repair  
Mercer Island, Washington



Figure 5



## **APPENDIX A**

### **References Exploration Logs**



## SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS  (LITTLE OR NO FINES)		<b>GW</b>	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
		GRAVELS WITH FINES  (APPRECIABLE AMOUNT OF FINES)		<b>GP</b>	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
				<b>GM</b>	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
			<b>GC</b>	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES	
	SAND AND SANDY SOILS	CLEAN SANDS  (LITTLE OR NO FINES)		<b>SW</b>	WELL-GRADED SANDS, GRAVELLY SANDS
		SANDS WITH FINES  (APPRECIABLE AMOUNT OF FINES)		<b>SP</b>	POORLY-GRADED SANDS, GRAVELLY SAND
			<b>SM</b>	SILTY SANDS, SAND - SILT MIXTURES	
			<b>SC</b>	CLAYEY SANDS, SAND - CLAY MIXTURES	
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		<b>ML</b>	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
				<b>CL</b>	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				<b>OL</b>	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		<b>MH</b>	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
				<b>CH</b>	INORGANIC CLAYS OF HIGH PLASTICITY
				<b>OH</b>	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS				<b>PT</b>	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	
	<b>AC</b>	Asphalt Concrete
	<b>CC</b>	Cement Concrete
	<b>CR</b>	Crushed Rock/Quarry Spalls
	<b>SOD</b>	Sod/Forest Duff
	<b>TS</b>	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





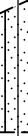


NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen

## Key to Exploration Logs



Figure A-1

Drilled	Start 4/1/2022	End 4/1/2022	Total Depth (ft)	13.5	Logged By Checked By	LSP BEL	Driller	Geologic Drill Technologies	Drilling Method	Hollow-stem Auger
Surface Elevation (ft) Vertical Datum	23 NAVD88				Hammer Data	Rope & Cathead 140 (lbs) / 30 (in) Drop			Drilling Equipment	Mini Track Rig
Easting (X) Northing (Y)	1297163 218603				System Datum	WA State Plane South NAD83 (feet)			Groundwater not observed at time of exploration	
Notes:										

Elevation (feet)	Depth (feet)	FIELD DATA				Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
		Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing						
0							ML	Dark brown sandy silt with organics (stiff, moist) (sod)			
							ML	Gray sandy silt with occasional oxidation staining (hard, moist) (glacial till)			
20			18	34					13	67	
	5		18	55	2						
15			11	50/5"	3						
	10		6	50/6"	4		SM	Gray silty fine sand (very dense, moist)			
			18	71	5 SA		ML	Gray silt with sand (hard, moist)	16	74	
			18	86	6						
10											

Practical drilling refusal at 13½ feet

Note: See Figure A-1 for explanation of symbols.  
Coordinates Data Source: Horizontal approximated based on Esri Survey. Vertical approximated based on Project Survey.

### Log of Boring B-1



Project: Luther Burbank Park Upland Improvements  
Project Location: Mercer Island, Washington  
Project Number: 0817-024-01

Figure A-2  
Sheet 1 of 1

Date: 4/21/22 Path: P:\0817024\GINT\081702401.GPJ DBLibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017\GLB\GEB\GEO TECH\STANDARD\_SF\_NO\_GW

Drilled	Start 4/1/2022	End 4/1/2022	Total Depth (ft)	11	Logged By Checked By	LSP BEL	Driller	Geologic Drill Technologies	Drilling Method	Hollow-stem Auger	
Surface Elevation (ft) Vertical Datum			20 NAVD88		Hammer Data		Rope & Cathead 140 (lbs) / 30 (in) Drop		Drilling Equipment		Mini Track Rig
Easting (X) Northing (Y)			1297149 218583		System Datum		WA State Plane South NAD83 (feet)		Groundwater not observed at time of exploration		
Notes:											

[illegible]

---

### Practical drilling refusal at 11 feet

Note: See Figure A-1 for explanation of symbols.  
Coordinates Data Source: Horizontal approximated based on Esri Survey. Vertical approximated based on Project Survey.

## Log of Boring B-2

**GEOENGINEERS** 

Project: Luther Burbank Park Upland Improvements  
Project Location: Mercer Island, Washington  
Project Number: 0817-024-01

Figure A-3  
Sheet 1 of 1

Drilled	Start 4/1/2022	End 4/1/2022	Total Depth (ft)	11.5	Logged By Checked By	LSP BEL	Driller	Geologic Drill Technologies	Drilling Method	Hollow-stem Auger
Surface Elevation (ft) Vertical Datum			20 NAVD88		Hammer Data		Rope & Cathead 140 (lbs) / 30 (in) Drop		Drilling Equipment Mini Track Rig	
Easting (X) Northing (Y)			1297142 218689		System Datum		WA State Plane South NAD83 (feet)		See "Remarks" section for groundwater observed	
Notes:										

Elevation (feet)	Depth (feet)	FIELD DATA				Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
		Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing						
0							CC	Approximately 6 inches concrete			
	12	14			1		SPSM	Approximately 4 inches gray fine to coarse sand with silt (medium dense, moist) (base course)			
							ML	Gray sandy silt with gravel (stiff, moist) (fill)			
	15	WOH			2			Becomes wet			No sheen, slight odor Perched groundwater observed at approxiamtely 3 feet during drilling
5	16	46			3						Slight sheen, slight odor
	18	60			4		ML	Light brown sandy silt (hard, moist) (glacial till)			No sheen, no odor
10	16	60			5						No sheen, no odor

Note: See Figure A-1 for explanation of symbols.  
Coordinates Data Source: Horizontal approximated based on Esri Survey. Vertical approximated based on Project Survey.

### Log of Boring B-3



Project: Luther Burbank Park Upland Improvements  
Project Location: Mercer Island, Washington  
Project Number: 0817-024-01

Figure A-4  
Sheet 1 of 1

## **APPENDIX B**

### **Report Limitations and Guidelines for Use**

## **APPENDIX B**

### **REPORT LIMITATIONS AND GUIDELINES FOR USE<sup>1</sup>**

This appendix provides information to help you manage your risks with respect to the use of this report.

#### **Read These Provisions Closely**

It is important to recognize that the geoscience practices (geotechnical engineering, geology and environmental science) rely on professional judgment and opinion to a greater extent than other engineering and natural science disciplines, where more precise and/or readily observable data may exist. To help clients better understand how this difference pertains to our services, GeoEngineers includes the following explanatory “limitations” provisions in its reports. Please confer with GeoEngineers if you need to know more how these “Report Limitations and Guidelines for Use” apply to your project or site.

#### **Geotechnical Services are Performed for Specific Purposes, Persons and Projects**

This report has been prepared for KPFF Consulting Engineers and for the Project(s) specifically identified in the report. The information contained herein is not applicable to other sites or projects.

GeoEngineers structures its services to meet the specific needs of its clients. No party other than the party to whom this report is addressed may rely on the product of our services unless we agree to such reliance in advance and in writing. Within the limitations of the agreed scope of services for the Project, and its schedule and budget, our services have been executed in accordance with our Agreement with KPFF Consulting Engineers dated May 26, 2020 and amended on June 1, 2022 and generally accepted geotechnical practices in this area at the time this report was prepared. We do not authorize, and will not be responsible for, the use of this report for any purposes or projects other than those identified in the report.

#### **A Geotechnical Engineering or Geologic Report is based on a Unique Set of Project-Specific Factors**

This report has been prepared for the Luther Burbank Park Dock Repair project located at 2040 84<sup>th</sup> Avenue SE in Mercer Island, 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, it is important not to 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.

---

<sup>1</sup> Developed based on material provided by GBA, GeoProfessional Business Association; [www.geoprofessional.org](http://www.geoprofessional.org).

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.

If changes occur after the date of this report, GeoEngineers cannot be responsible for any consequences of such changes in relation to this report unless we have been given the opportunity to review our interpretations and recommendations. Based on that review, we can provide written modifications or confirmation, as appropriate.

### **Environmental Concerns are Not Covered**

Unless environmental services were specifically included in our scope of services, this report does not provide any environmental findings, conclusions, or recommendations, including but not limited to, the likelihood of encountering underground storage tanks or regulated contaminants.

### **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 man-made events such as construction on or adjacent to the site, new information or technology that becomes available subsequent to the report date, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. If more than a few months have passed since issuance of our report or work product, or if any of the described events may have occurred, please contact GeoEngineers before applying this report for its intended purpose so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

### **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 the specific subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied its professional judgment to render an informed opinion about subsurface conditions at other locations. Actual subsurface conditions may differ, sometimes significantly, from the opinions presented in this report. Our report, conclusions and interpretations are not a warranty of the actual subsurface conditions.

### **Geotechnical Engineering Report Recommendations are Not Final**

We have developed the following recommendations based on data gathered from subsurface investigation(s). These investigations sample just a small percentage of a site to create a snapshot of the subsurface conditions elsewhere on the site. Such sampling on its own cannot provide a complete and accurate view of subsurface conditions for the entire site. Therefore, the recommendations included in this report are preliminary and should not be considered final. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers cannot assume responsibility or liability for the recommendations in this report if we do not perform construction observation.

We recommend that you allow sufficient monitoring, testing and consultation during construction by GeoEngineers to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes if the conditions revealed during the work differ from those anticipated, and to evaluate whether earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective means of managing the risks associated with unanticipated conditions. If another party performs field observation and confirms our expectations, the other party must take full responsibility for both the observations and recommendations. Please note, however, that another party would lack our project-specific knowledge and resources.

### **A Geotechnical Engineering or Geologic Report Could Be Subject to Misinterpretation**

Misinterpretation of this report by members of the design team or by contractors can result in costly problems. GeoEngineers can help reduce the risks of misinterpretation by conferring with appropriate members of the design team after submitting the report, reviewing pertinent elements of the design team's plans and specifications, participating in pre-bid and preconstruction conferences, and 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. The logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Photographic or electronic reproduction is acceptable, but separating logs from the report can create a risk of misinterpretation.

### **Give Contractors a Complete Report and Guidance**

To help reduce the risk of problems associated with unanticipated subsurface conditions, GeoEngineers recommends giving contractors the complete geotechnical engineering or geologic report, including these "Report Limitations and Guidelines for Use." When providing the report, you should preface it with a clearly written letter of transmittal that:

- Advises contractors that the report was not prepared for purposes of bid development and that its accuracy is limited; and
- Encourages contractors to conduct additional study to obtain the specific types of information they need or prefer.

### **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 adjacent properties.

### **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.

A Client that desires these specialized services is advised to obtain them from a consultant who offers services in this specialized field.

### **Information Provided by Others**

GeoEngineers has relied upon certain data or information provided or compiled by others in the performance of our services. Although we use sources that we reasonably believe to be trustworthy, GeoEngineers cannot warrant or guarantee the accuracy or completeness of information provided or compiled by others.



## **Geotechnical Engineering Services**

Luther Burbank Park Upland Improvements Mercer  
Island, Washington

*for*

**City of Mercer Island**

August 5, 2022



**GEOENGINEERS**   
Earth Science + Technology

## **Geotechnical Engineering Services**

Luther Burbank Park Upland Improvements  
Mercer Island, Washington

*for*

**City of Mercer Island**

August 5, 2022



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**Geotechnical Engineering Services**  
**Luther Burbank Park Upland Improvements**  
**Mercer Island, Washington**

**File No. 0817-024-01**

**August 5, 2022**

Prepared for:

City of Mercer Island Public Works  
9601 SE 36<sup>th</sup> Street  
Mercer Island, Washington 98040

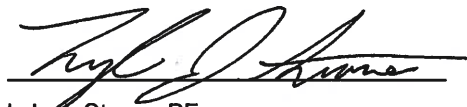
Attention: Paul West, CIP Project Manager

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Appendix B. Report Limitations and Guidelines for Use

## 1.0 INTRODUCTION AND PROJECT UNDERSTANDING

This report presents the results of our geotechnical engineering services for the Luther Burbank Park Upland Improvements project. The project site is located at 2040 84<sup>th</sup> Avenue SE in Mercer Island, Washington. A vicinity map is provided as Figure 1. Our understanding of the project is based on our communications with you and project partners, KPFF and Swenson Say Faget, review of the 30 percent upland improvement plans (dated September 8, 2022), review of construction plans for the existing dock and portions of the shoreline bulkhead dated April 1973 (1973 Dock Plans), and our prior experience at the site. We are currently providing geotechnical engineering services to support improvements to the existing docks at the park. This work is ongoing, and our services related to the dock will be provided in a separate geotechnical report.

Proposed upland improvements are expected to consist of four main components:

- A seismic retrofit of the existing boiler plant building, and installation of a perimeter drain around the structure boiler plant and concessions/restroom building.
- Construction of a new Americans with Disability Act (ADA) accessible pedestrian ramp leading from existing trails to a second-story rooftop classroom area on top of the restroom building.
- Replacement of existing pavement with low impact surfacing such as permeable pavers, Silva Cells or other similar products intended to limit stormwater runoff and construction.
- Decommissioning of underground storage tanks (USTs) in accordance with applicable regulations.

We understand that seismic design for the restroom building retrofit will be completed in accordance with ASCE 41-17. Seismic design for the pedestrian ramp will be completed in accordance with the 2018 International Building Code (IBC). We expect that stormwater management facilities at the site will be designed in accordance with 2014 Washington State Department of Ecology Stormwater Management Manual for Western Washington (SWMMWW) which has been adopted by the City of Mercer Island.

Based on the available information, we understand that there are two abandoned USTs in the project vicinity that were associated with previous boiler plant operations and that petroleum hydrocarbons associated with the tanks have been detected in site soil. We understand that the City of Mercer Island (City) is assessing the status of the tanks and current plans include leaving the tank in place, however removal of the tank is also being evaluated. GeoEngineers is providing environmental service to support decommissioning of the USTs. Our environmental services are being provided in separate deliverables.

## 2.0 SCOPE OF SERVICES

The purpose of our services was to explore subsurface conditions at the site as a basis for providing geotechnical recommendations for design and construction. Our services were completed in accordance with our signed agreement dated January 4, 2022. Our specific scope of services is summarized in our proposal dated January 4, 2022.



## 3.0 SITE CONDITIONS

### 3.1. Surface Conditions

The project site is located on the shoreline of Lake Washington approximately in the geographical center of the parks' shoreline frontage. Development at the site includes the historic brick boiler plant building, a brick restroom building that connects to the southwest corner of the boiler plant, a concrete shoreline bulkhead, concrete and brick paved sidewalks and landscaped areas.

The boiler plant and restroom buildings are constructed into the toe of an upland slope that grades downward from the higher elevation portions of the park to the west to shoreline of Lake Washington. The slope behind the buildings is on the order of 50 to 60 feet tall and is inclined between 2 Horizontal to 1 Vertical (2H:1V) and 1.25H:1V. There is about a 1-foot gap between the back (western) sides of the buildings and the slope except for the lower 4 to 5 feet of the slope toe where the western walls of the buildings retain the lower portion of the slope. The upland slope behind the buildings is vegetated with trees and developed with foot-trails that provide access to the shoreline. Access to the shoreline area is also provided by two more primary routes: (1) a gravel surfaced maintenance road to the south of the buildings that is inclined around 4H:1V and (2) an asphalt paved walkway to the north of the building that is inclined on the order of 2H:1V. An apparent stormwater conveyance swale (ditch) is located along the western edge of the gravel maintenance road.

The existing shoreline bulkhead is approximately 200 feet long. The southern terminus of the bulkhead is just south of the access point to docks and the northern terminus of the bulkhead is about 15 feet north of the boiler plant building. The bulkhead has two circular "push-outs" that provide viewing areas. The southern push-out is planted with three trees. Based on our review of historic areal imagery, we understand the straight section of bulkhead in front of the boiler plant building was construed at the same time as the boiler plant (approximately 1928). The push-outs appear to have been constructed at the same time as the restroom building (1970's). According to the 1973 Dock Plans, the push out sections of the bulkhead are supported on shallow foundations. We expect that the original section of bulkhead and the existing boiler plant and restroom buildings are also supported on shallow foundations.

### 3.2. Subsurface Conditions

#### 3.2.1. Literature Review

We reviewed the Geologic Map of King County (2007). According to the map the project site is underlain by glacial till (Qvt). Glacial till is typically comprised of a mixture of sand, gravel and cobbles in a silt matrix. Glacial till soils were consolidated by the weight of the overriding glacier and are typically dense to very dense.

We reviewed geologic and geotechnical information provided to us for other projects completed within Luther Burbank Park. This included photos from installation of a stormwater utility on the north side of the boiler plant building in 2018. The soils exposed in the reviewed photos are consistent with glacial till or other glacially consolidated soils.

We also searched for readily available geotechnical information in the project vicinity using the Washington State Department of Natural Resources Geologic Information Portal. We reviewed summary exploration logs associated with design of the Mercer Island Community and Event Center which is located to the west

and upland of Luther Burbank Park. Reviewed exploration logs indicated that dense glacially consolidated soils were present near existing ground surface at that site.

### **3.2.2. Subsurface Explorations and Laboratory Testing**

As part of our study, we advanced three hollow stem auger borings in the vicinity of the proposed improvements. The locations of our explorations are shown on the Site Plan, Figure 2. The borings were drilled on April 1, 2020 to depths between 11 and 13.5 feet below ground surface (bgs). A description of the field exploration program and the boring logs are presented in Appendix A.

Soil samples obtained from the borings were taken to our Redmond geotechnical laboratory for further evaluation. Testing included moisture content determinations, percent fines determinations and gradation analyses. A description of the laboratory test procedures and test results are presented in Appendix A.

### **3.2.3. Soil Conditions**

Borings B-1 and B-2 were advanced in areas currently surfaced with sod. Sod thicknesses were typically on the order of 6 inches or less. Below the sod in B-1 and B-2 we observed what we interpret to be glacial till. Glacial till soils typically consisted of hard silt with sand and sandy silt with. We observed occasional gravel within the till and while not directly observed, we expect that cobbles and boulders could also be present within the glacial till. Practical drilling refusal was encountered in B-1 around 13.5 feet bgs and around 11 feet bgs in B-2.

B-3 was advanced within a concrete paved sidewalk area near the location of the relic USTs. Concrete thickness was on the order of 6 inches at the boring location and the concrete was underlain by about 4 inches of base course material. Below the base course in B-3 we observed what we interpret to be fill extending to around 7 feet bgs. Underlying the fill was glacial till. Observed fill generally consisted of stiff sandy silt which we expect is reworked native soil. Underlying glacial till was hard and consisted of material similar to the glacial till observed in B-1 and B-2.

### **3.2.4. Groundwater Conditions**

Our understanding of groundwater conditions is based on conditions observed during drilling of our borings and groundwater measurements taken in two previously installed monitoring wells at the site. The monitoring wells are located about 5 feet from the eastern edge of the shoreline bulkhead within the brick paved sidewalk area in front of the restroom building. Groundwater was measured in these wells around 2 feet below ground surface which was consistent with the distance to the water level in Lake Washington as measured from the ground surface elevation of the bulkhead. We expect that the groundwater observed in the wells is hydraulically connected with the water levels in Lake Washington and will fluctuate seasonally with lake levels.

Groundwater was observed in B-3 around 3 feet bgs during drilling. B-3 was located about 5 feet west of the previously mentioned monitoring wells. The groundwater observed in B-3 was located within the fill and was perched on top of the underlying glacial till soils which were observed to be moist.

We did not observe groundwater during drilling of B-1 and B-2. Soil samples collected in B-1 and B-2 appeared moist and we did not observe indications of soil oxidation or staining that would suggest that groundwater periodically flows through the glacial till. Based on these observations it does not appear that the water in Lake Washington penetrates into or flows through the intact glacial till at the site.

During our surface reconnaissance we did not observe active groundwater seepage on the face of the hillside behind the boiler plant and restroom building. However, based on our conversations with the project team we understand that groundwater seepage is routinely observed on the face of the hillside in some areas. This is not unusual on slopes comprised of glacially consolidated soils and perched groundwater tends to accumulate within portions of the deposits that contain higher percentages of sand and gravel and lower percentages of silt and clay or within areas that have higher degree of weathering. Perched groundwater volumes tend to fluctuate throughout the year typically being highest during winter and spring months and during periods of prolonged precipitation.

## 4.0 CONCLUSIONS AND RECOMMENDATIONS

### 4.1. Geologic Hazards

We evaluated the site for geologic hazards as described in Mercer Island City Code 19.07.160 – Geologically Hazardous Areas. This includes landslide hazard areas, seismic hazard areas, and erosion hazard areas. We did not observe indicators of a landslide hazard area during our study. Potential seismic hazards are addressed in the Seismic Design section. In our opinion, the site does not pose an erosion hazard provided best management practices are implemented and our erosion and sedimentation control recommendations are followed as outlined in the Site Development and Earthwork section. Based on our review of available information, to our knowledge, no other geologic hazards are mapped in the project area.

### 4.2. Seismic Design

#### 4.2.1. Seismic Design Parameters

The tables below provide seismic design parameters developed in accordance with ASCE 41-17 for the BSE-1 (5 percent chance of exceedance in 50 years) and BSE-2 (20 percent chance of exceedance in 50 years) seismic events and in accordance with the 2018 IBC which references ASCE 7-16. The project site is underlain by dense to very dense glacially consolidated soils and we recommend using a response spectrum for Site Class C for this site.

**TABLE 1. SEISMIC DESIGN PARAMETERS ASCE 41-17**

Seismic Design Parameter	BSE-1 (5% exceedance in 50 years)	BSE-2 (20% exceedance in 50 years)
Spectral Response Acceleration at Short Periods ( $S_s$ )	1.034g	0.489
Spectral Response Acceleration at 1-Second Periods ( $S_1$ )	0.351g	0.152
Site Class	C	C
Site Modified Spectral Response Acceleration at Short Periods ( $S_{XS}$ )	1.241g	0.635
Site Modified Spectral Response Acceleration at 1-Second Periods ( $S_{X1}$ )	0.527g	0.228

**TABLE 2. SEISMIC DESIGN PARAMETERS 2018 IBC**

2018 IBC Seismic Design Parameters	
Spectral Response Acceleration at Short Periods ( $S_s$ )	1.388g
Spectral Response Acceleration at 1-Second Periods ( $S_1$ )	0.482g
Site Class	C
Site Modified Peak Ground Acceleration ( $PGA_M$ )	0.712g
Design Spectral Response Acceleration at Short Periods ( $SD_s$ )	1.11g
Design Spectral Response Acceleration at 1-Second Periods ( $SD_1$ )	0.483g

#### 4.2.2. Liquefaction, Lateral Spreading and Surface Rupture

Liquefaction refers to a condition where vibration or shaking of the ground, usually from earthquake forces, results in development of excess pore pressures and subsequent loss of strength in the affected soil deposit. In general, soils that are susceptible to liquefaction include loose to medium dense “clean” to silty sands that are below the water table.

Based on the soil conditions observed in our explorations and our understanding of the site geology, in our opinion it is unlikely that there are potentially liquefiable soils present at the project site and there is a low risk of liquefaction occurring during the seismic design events.

Lateral spreading related to seismic activity typically involves lateral displacement of large, surficial blocks of non-liquefied soil when an underlying soil layer loses strength during seismic shaking. Lateral spreading usually develops in areas where sloping ground or large grade changes (including retaining walls) are present. Due to the low liquefaction risk at the site, in our opinion there is also a low risk of lateral spreading occurring at this site.

According to the Department of Natural Resources Seismic Hazards Map, the project site is in the vicinity of the Seattle Fault zone. However, because bedrock in this area is covered by hundreds of feet of glacial soils, it is unlikely that movement of the fault would result in significant surface rupture at the ground surface.

### 4.3. Foundation Support

#### 4.3.1. General

The sections below provide design and construction recommendations for conventional shallow foundations (spread footings), drilled pier type foundations (pier foundations) and micropiles. We have also included recommendations for evaluating the foundations of existing structures at the site.

We understand that a perimeter footing drain will be installed on the west side of the existing restroom and boiler plant buildings. Recommendations for design of footing drains are included in Section 4.3.2.6.

#### **4.3.2. Spread Footings**

##### **4.3.2.1. General**

In our opinion, the proposed structures can be adequately supported on shallow foundations bearing on glacial till soils. Glacial till soils are expected to be present within about a foot of the ground surface across the site. The depth to glacial till could vary in areas where grading or fill activities have occurred. Because glacial till soils are expected to be present at shallow depths, we recommend that existing fill, if present, be removed from below footings.

For spread foundation design, we recommend that footings be established at least 18 inches below the lowest adjacent grade and have minimum widths of 24 inches.

##### **4.3.2.2. Foundation Bearing Surface Preparation and Protection**

Shallow footing excavations should be performed using a smooth-edged bucket to limit bearing disturbance. We recommend that the base of all footing excavations be proof compacted to a uniformly firm and unyielding condition prior to placement of structural fill, formwork or rebar. Loose or disturbed materials present at the base of footing excavations should be removed or compacted. Fill, if present, should be removed from below spread footings. If soft or otherwise unsuitable areas are observed at the foundation bearing surface that cannot be compacted to a stable and uniformly firm condition the following options may be considered: (1) the exposed soils may be moisture conditioned and recompact; or (2) the unsuitable soils may be overexcavated and replaced with compacted structural fill, as needed.

Foundation bearing surfaces should not be exposed to standing water. If water is present in the excavation, it must be removed before placing structural fill, formwork and reinforcing steel. Protection of exposed soil should be considered during the wetter times of the year. Typically, a 3- to 4-inch lean concrete mat or a 6- to 8-inch crushed rock section is suitable for foundation bearing surface protection.

Prepared foundation bearing surfaces should be observed and evaluated by a member of our firm prior to placement of structural fill, formwork or steel reinforcement. Our representative will confirm that the bearing surfaces have been prepared in accordance with our recommendations and is suitable for supporting the design footing load and provide recommendations for remediation, if necessary.

##### **4.3.2.3. Allowable Soil Bearing Resistance**

Spread footings bearing on subgrades prepared as recommended may be designed using an allowable soil bearing pressure of 4,000 pounds per square foot (psf). This bearing pressure applies to the total of dead and long-term live loads and may be increased by one-third when considering total loads, including earthquake or wind loads. This bearing pressure assumes that footings are located on level ground. If footings are located in areas of sloping ground, the allowable bearing pressure should be decreased by a factor of 0.5 for slope inclinations up to 2H:1V. We do not recommend that spread footings be located on slopes that are steeper than 2H:1V.

These are net bearing pressures. The weight of the footing and overlying backfill can be ignored in calculating footing sizes. Higher bearing pressures may be applicable on a case-by-case basis provided footing elevations, loading conditions are known, and subgrades are protected during construction. We can work with the design team to evaluate increased bearing pressures, if this would provide value to the project.

#### **4.3.2.4. Foundation Settlement**

Disturbed soil must be removed from the base of footing excavations and the bearing surface should be prepared as recommended. Provided these measures are taken, we estimate the total static settlement of shallow foundations will be on the order of 1 inch or less for the bearing pressures presented above. Differential settlements could be on the order of ¼ to ½ inch between comparably loaded isolated column footings or along 50 feet of continuous footing. Settlement is expected to occur rapidly as loads are applied. Settlements could be greater than estimated if loose or disturbed soil is present beneath footings.

#### **4.3.2.5. Lateral Resistance**

The ability of the soil to resist lateral loads is a function of frictional resistance, which can develop on the base of footings and slabs and the passive resistance, which can develop on the face of below-grade elements of the structure as these elements tend to move into the soil. The allowable frictional resistance on the base of the footing may be computed using a coefficient of friction of 0.4 applied to the vertical dead-load forces. The allowable passive resistance on the face of the footing or other embedded foundation elements may be computed using an equivalent fluid density of 350 pounds per cubic foot (pcf) for undisturbed site soils or structural fill extending out from the face of the foundation element a distance at least equal to two and one-half times the depth of the element. These values include a factor of safety of about 1.5.

The passive earth pressure and friction components may be combined provided that the passive component does not exceed two-thirds of the total. For level ground conditions, the top foot of soil should be neglected when calculating passive lateral earth pressure unless the area adjacent to the foundation is covered with pavement or a slab-on-grade. If footings are located on sloping ground, the top 2 feet of soil should be neglected when calculating passive lateral earth pressures.

#### **4.3.2.6. Perimeter Footing Drains**

We understand that a perimeter drain will be installed on the west side of the existing building. Perimeter footing drains should be provided with cleanouts and should consist of at least 4-inch-diameter perforated pipe surrounded on all sides by 6 inches of drain material enclosed in a non-woven geotextile fabric for underground drainage to prevent fine soil from migrating into the drain material. We recommend that the drainpipe consist of either heavy-wall solid pipe or rigid corrugated smooth interior polyethylene pipe. We do not recommend using flexible tubing for footing drainpipes. The drain material should consist of pea gravel or material similar to "Gravel Backfill for Drains" per Washington State Department of Transportation (WSDOT) Standard Specifications Section 9-03.12(4). The perimeter drains should be sloped to drain by gravity, if practical, to a suitable discharge point. Water collected in roof downspout lines must not be routed to the perimeter footing drains. Provided the envisioned perimeter footing drain is installed as recommended, in our opinion individual footing drains or below slab drains are not necessary.

#### **4.3.3. Bearing Resistance of Existing Footings**

We understand that the existing footings for the boiler plant, restroom building, and bulkhead walls will be evaluated considering current building codes and may be relied upon to resist loads from new improvements. Based on review of provided as-built drawings the existing structures are supported on shallow spread footings. It is unclear what bearing pressures were assumed for design of the footings and what methods were used for preparing foundation bearing surfaces. At this time, we recommend that the existing footings be evaluated using an allowable bearing resistance of 3,500 psf. Existing footings can be evaluated using the lateral resistance values provided above.

If more information on design and construction of the existing footings is obtained, or if can be confirmed that the existing foundations are bearing directly on intact glacial till, we expect that a higher bearing resistance bearing could be considered. Depending on structural demands it could be necessary to retrofit existing footings using deep foundations. For this site we expect that drilled micropiles are the most feasible solution for reinforcing existing footings. Recommendations for design and construction of micropiles are included in Section 4.2.5 of this report.

#### **4.3.4. Pier Foundations**

##### **4.3.4.1. General**

We expect that pier foundations will consist of a precast or cast in place concrete foundation installed into a predrilled/or excavated hole. The sections below provide recommendations for design and construction of pier foundations.

##### **4.3.4.2. Axial Resistance**

Pier foundations will achieve axial downward resistance through end bearing resistance at the toe of the pier and through skin friction along the length of the foundation. Uplift resistance will be achieved through skin friction only.

We recommend that end bearing resistance of pier foundations be estimated assuming an allowable soil bearing pressure of 5,000 psf. Downward skin friction resistance can be estimated using an allowable unit skin resistance of 350 psf per linear foot of embedded foundation. Uplift skin friction resistance can be estimated using an allowable unit skin resistance of 300 psf per linear foot of embedded foundation. These values are appropriate for foundation embedment depths up to about 15 feet. If foundation embedment depths are expected to exceed, we should be contacted to consider a revised estimate of pier axial resistance based on the proposed structure.

For example, a 2 foot diameter pier footing embedded 10 feet below grade would achieve the following **allowable** resistances:

$$\text{End Bearing Resistance} = \text{Bearing pressure (psf)} \times \text{Toe Area (sf)}$$

$$= 5,000 \text{ psf} \times \pi \left( \frac{2 \text{ ft.}}{2} \right)^2 \cong 15,700 \text{ lbs.}$$

$$\text{Downward Skin Resistance} = \text{Unit Skin Resistance} \times \text{Pier Perimeter (ft)} \times \text{Pier Embedment (ft)}$$

$$= 350 \text{ psf} \times \pi (2 \text{ ft}) \times 10 \text{ ft.} \cong 22,000 \text{ lbs.}$$

$$\text{Upward Skin Resistance} = \text{Unit Uplift Resistance} \times \text{Pier Perimeter (ft)} \times \text{Pier Embedment (ft)}$$

$$= 300 \text{ psf} \times \pi (2 \text{ ft}) \times 10 \text{ ft.} \cong 18,850 \text{ lbs.}$$

##### **4.3.4.3. Lateral Resistance**

The tables below provide recommendations for evaluating lateral resistance of pier foundations. Table 3 provides allowable lateral bearing resistance values for the soils encountered in our borings. Lateral bearing resistances are based on correlations presented in Table 17-2 of the WSDOT *Geotechnical Design Manual*.



**TABLE 3. LATERAL SOIL BEARING RESISTANCE**

Depth Range (feet)	Allowable Lateral Bearing Resistance (psf)
0 to 5	2,000
5 and below	4,500

Table 4 provides recommended soil parameters for lateral pier foundation analyses using the software program LPILE (Ensoft Inc. 2016).

**TABLE 4. RECOMMENDED LPILE PARAMETERS**

Depth Range (feet)	p-y Curve Type	Eff. Unit Wt. (pcf)	Friction Angle (deg)	K (pci)
0 to 5	Sand (Reese)	125	34	200
5 and below	Sand (Reese)	125	38	225

If lateral pier foundation analyses are completed using LPILE, we recommend that we be allowed to review the results of the analyses to confirm that the results are consistent with our experience designing foundations and our understanding of soil conditions at the site.

#### **4.3.4.4. Construction Considerations**

We present two conditions to consider when constructing pier foundations.

- Condition 1, an excavation the same dimension of the designed foundation is created, and the precast foundation is placed in the excavation or the foundation is cast directly against undisturbed earth; or
- Condition 2, an excavation larger than the designed dimension of the foundation is created, a casing is placed into the excavation and the foundation concrete is cast inside the casing. The casing could be left in place permanently or removed from the excavation as the foundation is constructed. If the casing is left in place any overexcavated area outside of the casing would need to be backfilled with controlled density fill (CDF).

Construction of Condition 1 requires the sidewalls of the excavation to stay stable during construction of the foundation. Construction of Condition 2 does not require the sidewalls of the excavation to remain stable. Based on the soil and groundwater conditions at the site, in our opinion it is feasible to complete excavations for drilled pier foundations without the use of temporary casing (Condition 1). The use of temporary casing could still be desirable in areas of sloping ground, if groundwater seepage is encountered in excavations, or if the excavations will be left open for an extended period of time. If a sacrificial or permanent casing is used, this practice should be coordinated with the structural engineer.

Excavations for drilled pier foundations discussed above are typically completed with augers attached to tracked excavator type equipment. The size of excavator needed to complete the excavation will depend on the foundation diameter and depth. Selection of this foundation alternative should consider equipment access restrictions to the foundation locations.



We recommend that the base of the pier footing excavations be free of loose or disturbed soils prior to construction of the foundation. If loose or disturbed soils are present at the base of the excavation and cannot be adequately compacted or removed, we recommend that quarry spalls be pushed into the excavation subgrade until a stable base is established. If water accumulates in the excavation, the water should be removed from the excavation prior to pouring concrete.

#### **4.3.5. Micropiles**

##### **4.3.5.1. General**

Micropiles are small-diameter drilled piles (typically less than 12 inches in diameter) that are constructed by drilling a hole, placing reinforcement and then grouting the hole. Various methods can be used to drill the holes for micropiles. In our opinion, any drilling method can be considered provided it can form a stable hole at the required dimensions and within specified tolerances. Temporary casings are often used to help maintain stability of the excavation sidewalls during micropile drilling. In some cases, the steel casing is left in place, especially within the upper portions of the pile to increase the structural capacity of the micropiles.

Reinforcement generally consists of a large steel reinforcing bar installed down the center of the hole. The grouting method used to construct the micropiles has a significant impact on capacity. Micropiles installed by gravity grouting have lower capacities, and micropiles installed by pressure grouting or post-grouting (two-stage grouting process) can achieve much higher capacities. We typically recommend that micropiles be installed using pressure grouting or post-grouting methods.

Micropiles develop their resistance to axial loads primarily within the “bonded length” of the micropile (portion of the pile where grout is in direct contact with the soil and no outer casing is present). Axial resistance of micropiles is primarily derived from side friction within the bonded length. Because of their small diameters, end bearing resistance of micropiles is typically low compared to the side resistance. In our opinion, it is conservative to ignore the contribution of end bearing resistance when evaluating the axial capacity of micropiles.

##### **4.3.5.2. Design Recommendations**

We recommend that micropiles be designed using the procedures and recommendations outlined in the 2005 Federal Highway Administration (FHWA) *NHI-05-039, Micropile Design and Construction Manual*. We recommend that micropiles have a minimum embedment depth of 10 feet and have a minimum diameter of 6 inches.

In lieu of micropile resistance charts we have provided estimates of the soil-grout bond stress values for the various strata of the design soil profile. These values are summarized in Table 5. These unit values can be used to estimate resistances of micropiles of various diameters and lengths. In our opinion, the provided values are conservative with respect to micropile design. A sacrificial test micropile could be installed at the site and a load test completed to measure the achieved soil-grout bond strength and serve as a basis for designing the production micropiles.

**TABLE 5. MICROPILE DESIGN VALUES**

Depth Range <sup>1</sup>	Layer Ultimate <sup>2</sup> Soil Grout Bond Stress (psi)	Layer Ultimate <sup>2</sup> End Bearing Stress (psi)	Layer Ultimate <sup>2</sup> Uplift Soil Grout Bond Stress (psi)
0 to 5	120	N/A <sup>4</sup>	120
5 and below	200	N/A <sup>4</sup>	200

Notes: <sup>1</sup>Depths are referenced to existing ground surface

<sup>2</sup>These values assume the micropiles are installed using pressure grout or post grouting installation methods. The following factors of safety should be considered when evaluating allowable resistance. Static Conditions: Skin Friction = 2.0, Uplift = 2.0. Seismic Conditions: Skin Friction = 1.5, Uplift = 1.75

#### **4.3.5.3. Micropile Lateral Design**

Because micropiles are relatively slender, single micropiles often have a relatively low lateral capacity. It is often necessary to install micropiles in groups or use battered micropiles to resist lateral loads. Permanent steel casings are also used to help increase the lateral stiffness of micropiles.

In our opinion the geotechnical properties previously provided for lateral analysis of drilled pier foundations are also suitable for evaluating micropiles. Group effects can be considered negligible for groups of micropiles spaced greater than 3 diameters apart. If micropiles will be spaced closer than what is recommended above, we should be notified and can provide additional recommendations for evaluation group effects. If micropiles are included in this project we recommend that GeoEngineers review the results of the lateral analyses to confirm that the analysis was completed in accordance with the intent of our recommendations.

#### **4.3.5.4. Micropile Settlement**

Provided micropiles are designed as recommended, we estimate that the settlement of micropiles under static loads will generally be on the order of ½-inch or less, exclusive of the elastic micropile compression. Most of this settlement should occur rapidly as loads are applied. Differential settlement between adjacent micropiles is expected to be negligible.

#### **4.3.5.5. Micropile Testing**

Micropiles should be tested to verify the installed capacity. We recommend that a minimum of one sacrificial micropile be tested to at least 2 times the design load. The sacrificial micropile should be in the same general location as production micropiles and be installed using the same means and methods as the production piles. We recommend that a minimum of 10 percent of the production piles, but at least 2, be proof-tested to 1.67 times the design load. The structural engineer may require additional or alternative testing requirements.

Micropile load testing should be completed using a load frame capable of distributing large test loads into the near surface soils without damaging existing structural elements or below ground utilities. The location of the micropile pile load tests should be reviewed during the design phase to minimize impacts to existing improvements.

#### **4.3.5.6. Construction Considerations**

The contractor should be prepared to install micropiles below the groundwater table and through soils that contain gravel, cobbles and boulders. The contractor should be prepared to use casing and/or drilling fluid to maintain drill hole stability.

Micropile layout should consider the location of existing below grade improvements. If an obstacle is encountered during micropile installation, it may be necessary to adjust the micropile location. Typically adjusting micropile locations by up to 1 to 2 pile diameters can be accommodated without significant change to the foundation design. Adjustments to the locations of micropiles during construction should be reviewed by the structural engineer.

No direct information regarding capacity (e.g., driving resistance data) of the micropiles is obtained during installation. Therefore, we recommend the installation and testing of micropiles be carefully monitored by a member from our firm who can observe and document conditions encountered.

#### **4.4. Earth Pressures for Conventional Below-Grade Structures**

##### **4.4.1. Design Parameters**

We recommend the following lateral earth pressures be used for design of conventional retaining walls and below-grade structures. These values are also appropriate for evaluating the existing shoreline bulkhead and existing building walls which we understand are retaining soils at the toe of the slope. We recommend that the undrained parameters be used for evaluating earth pressures of the existing bulkhead. Undrained pressures should also be used for evaluating the existing building walls unless a perimeter drain is installed behind the structure. For other walls, if drained design parameters are used, drainage systems must be included in the design in accordance with the recommendations presented in Section 4.3.2 below.

- Active soil pressure may be estimated using an equivalent fluid density of 35 pcf for the drained condition.
- Active soil pressure may be estimated using an equivalent fluid density of 85 pcf for the undrained condition; this value includes hydrostatic pressures.
- At-rest soil pressure may be estimated using an equivalent fluid density of 55 pcf for the drained condition.
- At-rest soil pressure may be estimated using an equivalent fluid density of 95 pcf for the undrained condition; this value includes hydrostatic pressures.
- For backfill sloping conditions up to 2H:1V, the soil pressures presented above should be increased by 15 percent.
- For seismic considerations, a uniform lateral pressure of 10H psf (where H is the height of the retaining structure or the depth of a structure below ground surface) should be added to the lateral earth pressure.
- A traffic surcharge should be included if vehicles are allowed to operate within  $\frac{1}{2}$  the height of the retaining walls. A typical traffic surcharge of 250 psf can be estimated by assuming an additional 2 feet of fill as part of the wall height. Other surcharge loads should be considered on a case-by-case basis. We can provide additional surcharge loads for specific loading conditions once known.

The active soil pressure condition assumes the wall is free to move laterally 0.001 H, where H is the wall height). The at-rest condition is applicable where walls are restrained from movement. The above-recommended lateral soil pressures do not include surcharge loads than those described.

Over-compaction of fill placed directly behind retaining walls or below-grade structures must be avoided. We recommend use of hand-operated compaction equipment and maximum 6-inch loose lift thickness when compacting fill within about 5 feet of retaining walls and below-grade structures.

Retaining wall foundation bearing surfaces should be prepared following Section 4.2 of this report. Provided bearing surfaces are prepared as recommended retaining wall foundations may be designed using the allowable soil bearing values and lateral resistance values presented previously.

#### **4.4.2. Drainage**

If retaining walls or below-grade structures are designed using drained parameters, a drainage system behind the structure must be constructed to collect water and prevent the buildup of hydrostatic pressure against the structure. We recommend the drainage system include a zone of free-draining backfill a minimum of 18 inches in width against the back of the wall. The drainage material should consist of coarse sand and gravel containing less than 5 percent fines based on the fraction of material passing the 3/4-inch sieve. Material similar to "Gravel Backfill for Drains" per WSDOT Standard Specifications Section 9-03.12(4) is also suitable. Waffle board-type drainage mats may be considered instead of gravel provided they are protected from accumulating silt and discharge appropriately.

A perforated, rigid, smooth-walled drainpipe with a minimum diameter of 4 inches should be placed along the base of the structure within the free-draining backfill and extend for the entire wall length. The drain pipe should be metal or rigid PVC pipe and be sloped to drain by gravity. Discharge should be routed to appropriate discharge areas and designed to reduce erosion potential. Cleanouts should be provided to allow routine maintenance. We recommend roof downspouts or other types of drainage systems not be connected to retaining wall drain systems.

#### **4.5. Stormwater Management**

Stormwater infiltration facilities are not currently envisioned for this project, however use of porous surfacing or pavement systems that designed to store and transport collected water (e.g. Silva Cells) are being considered.

The site has a very low potential for stormwater infiltration. Existing soils at the site are comprised of very compact, hard, fine grained glacially consolidated soils that have very slow infiltration rates and based on the proximity to the lake, anticipated groundwater levels in level portions of the site are expected within a few feet of the ground surface. Based on these conditions we do not recommend that traditional stormwater infiltration facilities such as bioswales, infiltration trenches or permeable pavements be considered for use at this site. Infiltration in specific areas of the site where historical grading has taken place or where fill is present could be feasible, however additional studies would need to be completed to further evaluate infiltration potential.

Silva Cells are described as a modular suspended pavement system. The cells consist of square or rectangular units that include a roof and bottom supported by four "posts" at the corners. The units have open sides and hollow interior. The cell interiors are typically filled with porous soil that allow for the storage and transportation of stormwater. While some infiltration through the base of the cells can occur, the cells can be designed assuming no infiltration and an underdrain system is typically included to discharge stormwater. Once installed the cell system can support different surfacing materials including pavers, gravel surfacing and in certain cases traditional pavements.

Silva Cells or other systems are often designed by the product manufacturer, and we recommend that they be consulted during design if these systems are being used.

To support design of stormwater collection and storage systems, the table below includes typical soil properties for common backfill materials and existing soils at the site.

**TABLE 6. TYPICAL SOIL HYDRAULIC PROPERTIES**

Soil Type	Referenced Gradation	Estimated Hydraulic Conductivity (inches per hour)	Porosity (n)	Void Ratio (e)
Glacial till	See Figure A-5 in Appendix A	<0.01	0.15	0.17
WSDOT Gravel Borrow	WSDOT Standard Specification 9-03.14(1)	29	0.29	0.41
WSDOT Select Borrow	WSDOT Standard Specification 9-03.14(2)	42	0.26	0.35
WSDOT Common Borrow	WSDOT Standard Specification 9-03.14(3)	20	0.24	0.32
Silty Sand with Occasional Gravel	Gravel = 4% Sand = 66% Silt = 30%	0.3	0.26	0.35
Silty Sand with Gravel	Gravel = 19% Sand = 51% Silt = 30%	0.75	0.22	0.28
Fine Sand	Sand = 99% Silt = 1%	0.5	0.3	0.43

Notes:

Provided values are approximate and are based on WSDOT research report WA-RD 872.1 and our experience.

Estimates hydraulic conductivity, porosity and void ratio values are based for compacted soils.

## 4.6. Site Development and Earthwork

We anticipate that site development and earthwork will include demolition of existing features, excavating for shallow foundations, utilities and other improvements, establishing subgrades for structures and hardscaping, and placing and compacting fill and backfill materials. We expect that site grading and earthwork can be accomplished with conventional earthmoving equipment. The following sections provide specific recommendations for site development and earthwork.

### 4.6.1. Clearing, Stripping and Demolition

Clearing and stripping depths will likely be on the order of 2 inches in areas currently surfaced with sod or other surface vegetation. Greater stripping depths could be required within structural areas or areas of unsuitable soils, if observed during construction. Stripped grass and sod material must not be re-used as fill.

Coarse gravel, cobbles and boulders should be expected within the glacial till soils present at the site. Accordingly, the contractor should be prepared to remove boulders and cobbles, if encountered during

grading or excavation. Boulders may be removed from the site or used in landscape areas. Voids caused by boulder removal should be backfilled with structural fill.

We recommend that existing pavements and hardscaping be completely removed from areas that will be developed. During removal of these features, disturbance of surficial soils may occur, especially if left exposed to wet conditions. Disturbed soils may require additional remediation during construction and grading. If utilities exist beneath planned structures, they should be removed and backfilled or abandoned in place.

#### **4.6.2. Erosion and Sedimentation Control**

Erosion and sedimentation rates and quantities can be influenced by construction methods, slope length and gradient, amount of soil exposed and/or disturbed, soil type, construction sequencing and weather. Implementing an Erosion and Sedimentation Control Plan will reduce the project impact on erosion-prone areas. The plan should be designed in accordance with applicable city, county and/or state standards. The plan should incorporate basic planning principles, including:

- Scheduling grading and construction to reduce soil exposure;
- Re-vegetating or mulching denuded areas;
- Directing runoff away from exposed soils;
- Reducing the length and steepness of slopes with exposed soils;
- Decreasing runoff velocities;
- Preparing drainage ways and outlets to handle concentrated or increased runoff;
- Confining sediment to the project site; and
- Inspecting and maintaining control measures frequently.

Some sloughing and raveling of exposed or disturbed soil on slopes should be expected. We recommend that disturbed soil be restored promptly so that surface runoff does not become channeled.

Temporary erosion protection should be used and maintained in areas with exposed or disturbed soils to help reduce erosion and reduce transport of sediment to adjacent areas and receiving waters. Permanent erosion protection should be provided by paving, structure construction or landscape planting.

Until the permanent erosion protection is established, and the site is stabilized, site monitoring may be required by qualified personnel to evaluate the effectiveness of the erosion control measures and to 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.

#### **4.6.3. Temporary Excavation**

Excavations deeper than 4 feet must be shored or laid back at a stable slope if workers are required to enter. Shoring and temporary slope inclinations must conform to the provisions of Title 296 Washington Administrative Code (WAC), Part N, "Excavation, Trenching and Shoring." Regardless of the soil type encountered in the excavation, shoring, trench boxes or sloped sidewalls will be required under Washington Industrial Safety and Health Act (WISHA). The contract documents should specify that the contractor is

responsible for selecting excavation and dewatering methods, monitoring the excavations for safety and providing shoring, as required, to protect personnel and structures.

The glacial till soils are hard and have some amount of cohesion that can allow them to stand vertical or near vertical for a limited amount of time. These soils can also slough unexpectedly. In general, temporary cut slopes at this site should be planned to be inclined no steeper than about 1½H to 1V (horizontal to vertical). Steeper slopes, up to about 1H to 1V can be considered within the intact glacial till deposits provided the contractor's competent person concurs with this assessment and monitors excavations in accordance with applicable regulations. This guideline assumes that all surface loads are kept at a minimum distance of at least one-half the depth of the cut away from the top of the slope and that seepage is not present on the slope face. Flatter cut slopes will be necessary where seepage occurs or if surcharge loads are anticipated. Temporary covering with heavy plastic sheeting should be used to protect slopes during periods of wet weather.

#### **4.6.4. Permanent Slopes**

If permanent slopes are necessary, we recommend they be constructed at a maximum inclination of 2H:1V. Where 2H:1V permanent slopes are not feasible, protective facings and/or retaining structures should be considered.

To achieve uniform compaction, we recommend that fill slopes be overbuilt slightly and subsequently cut back to expose well-compacted fill. Fill placement on slopes steeper than about 5H:1V should be benched into the slope face. The configuration of benches depends on the equipment being used. Bench excavations should be level and extend into the slope face.

Exposed areas should be re-vegetated as soon as practical to reduce the surface erosion and sloughing. Temporary protection should be used until permanent protection is established.

#### **4.6.5. Groundwater Handling Considerations**

In shoreline areas, groundwater should be expected in excavations that extend more than a few feet below the ground surface. Groundwater levels near the lake are expected to match water levels in Lake Washington. The glacial till soils have a very low permeability, therefore the quantity of water seeping into the excavation is expected to be low through these native soils and is expected to be manageable with isolated sumps and pumps. In areas where fill is present, groundwater handling could be more extensive. Groundwater could be especially challenging in areas where old utility trenches or pipe bedding are located and connect or otherwise provide a conduit to the shoreline of Lake Washington. If these conditions exist, the contractor might need to construct trench dams or other measures to slow groundwater flow.

Within the hillside area west of the existing buildings, we expect that perched groundwater could be encountered in shallow excavations. Perched groundwater can likely be handled adequately with sumps, pumps, and/or diversion ditches, as necessary. Groundwater seepage handling needs will typically be lower during the late summer and early fall months. Ultimately, we recommend that the contractor performing the work be made responsible for controlling and collecting groundwater encountered.

#### **4.6.6. Surface Drainage**

Surface water from roofs, pavements and landscape areas should be collected and controlled. Curbs or other appropriate measures such as sloping pavements, sidewalks and landscape areas should be used



to direct surface flow away from buildings, erosion sensitive areas and from behind retaining structures. Roof and catchment drains should not be connected to wall or foundation drains.

#### **4.6.7. Subgrade Preparation**

Subgrades that will support slab-on-grade floors, pavements, and other site features bearing on final grade should be thoroughly compacted to a uniformly firm and unyielding condition on completion of stripping/excavation and before placing structural fill. We recommend that subgrades for structures, pavements and other bearing surfaces be evaluated, as appropriate, to identify areas of yielding or soft soil. Probing with a steel probe rod or proof-rolling with a heavy piece of wheeled construction equipment are appropriate methods of evaluation.

If soft or otherwise unsuitable subgrade areas are revealed during evaluation that cannot be compacted to a stable and uniformly firm condition, we recommend that: (1) the unsuitable soils be scarified (e.g., with a ripper or farmer's disc), aerated and recompact, if practical; or (2) the unsuitable soils be removed and replaced with compacted structural fill, as needed.

#### **4.6.8. Subgrade Protection and Wet Weather Considerations**

The wet weather season generally begins in October and continues through May in Western Washington; however, periods of wet weather can occur during any month of the year. The soils encountered in our explorations contain a significant amount of fines. Soil with high fines content is very sensitive to small changes in moisture and is susceptible to disturbance from construction traffic when wet or if earthwork is performed during wet weather. If wet weather earthwork is unavoidable, we recommend that the following steps be taken.

- The ground surface in and around the work area should be sloped so that surface water is directed away from the work area. The ground surface should be graded so 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.
- Earthwork activities should not take place during periods of heavy precipitation.
- Slopes with exposed soils should be covered with plastic sheeting.
- The contractor should take necessary measures to prevent on-site soils and other soils to be used as fill from becoming wet or unstable. These measures may include the use of plastic sheeting and controlling surface water with ditches, sumps with pumps and by grading. The site soils should not be left uncompacted and exposed to moisture. Sealing the exposed soils by rolling with a smooth-drum roller prior to periods of precipitation will help reduce the extent to which these soils become wet or unstable.
- Construction traffic should be restricted to specific areas of the site, preferably areas that are surfaced with working pad materials not susceptible to wet weather disturbance.
- Construction activities should be scheduled so that the length of time that soils are left exposed to moisture is reduced to the extent practical.
- During periods of wet weather, concrete should be placed as soon as practical after preparation of the footing excavations. Foundation bearing surfaces should not be exposed to standing water. If



water pools in the base of the excavation, it should be removed before placing structural fill or reinforcing steel.

- If footing excavations are exposed to extended wet weather conditions, a lean concrete mat or a layer of clean crushed rock can be considered for foundation bearing surface protection.

## **4.7. Fill Materials**

### **4.7.1. Structural Fill**

The workability of material for use as structural fill will depend on the gradation and moisture content of the soil. We recommend that washed crushed rock or select granular fill, as described below, be used for structural fill during the rainy season. If prolonged dry weather prevails during the earthwork phase of construction, materials with a somewhat higher fines content may be acceptable. Weather, material use, schedule, duration exposed, and site conditions should be considered when determining the type of import fill materials purchased and brought to the site for use as structural fill.

Material used for structural fill should be free of debris, organic material, and rock fragments larger than 6 inches. For most applications, we recommend that structural fill material consist of material similar to “Select Borrow” or “Gravel Borrow” as described in Section 9-03.14 of the Washington State Department of Transportation (WSDOT) Standard Specifications.

### **4.7.2. Select Granular Fill/Wet Weather Fill**

Select granular fill should consist of well-graded sand and gravel or crushed rock with a maximum particle size of 6 inches and less than 5 percent fines by weight based on the minus  $\frac{3}{4}$ -inch fraction. Organic matter, debris or other deleterious material should not be present. In our opinion, material with gradation characteristics similar to WSDOT Specification 9-03.9 (Aggregates for Ballast and Crushed Surfacing), “Gravel Backfill for Walls” as described in Section 9-03.12(2) of the WSDOT Standard Specifications, or 9-03.14 (Borrow) is suitable for use as select granular fill, provided that the fines content is less than 5 percent (based on the minus  $\frac{3}{4}$ -inch fraction) and the maximum particle size is 6 inches.

### **4.7.3. Pipe Bedding**

Trench backfill for the bedding and pipe zone should consist of well-graded granular material similar to “gravel backfill for pipe zone bedding” described in Section 9-03.12(3) of the WSDOT Standard Specifications. The material must be free of roots, debris, organic matter and other deleterious material. Other materials may be appropriate depending on manufacturer specifications and/or local jurisdiction requirements.

### **4.7.4. Trench Backfill**

Trench backfill must be free of debris, organic material and rock fragments larger than 6 inches. We recommend that import trench backfill material consist of material similar to “Select Borrow” or “Gravel Borrow” as described in Section 9-03.14 of the WSDOT Standard Specifications. Where water is present, alternative materials may need to be considered.

### **4.7.5. Gravel Backfill for Walls**

Backfill material used within 5 feet behind retaining walls should consist of free-draining material similar to “Gravel Backfill for Walls” as described in Section 9-03.12(2) of the WSDOT Standard Specifications.

#### **4.7.6. Capillary Break Material**

Structural fill placed as capillary break material below on-grade floor slabs should consist of ¾-inch coarse aggregate with negligible sand or silt as described in Section 9-03.1(4)C Grading No. 67 of the WSDOT Standard Specifications. WSDOT Specification 9-03.9 (Aggregates for Ballast and Crushed Surfacing, Crushed Surfacing Base Course [CSBC]) may also be considered.

#### **4.7.7. Crushed Surfacing for Pavements and Sidewalks**

Structural fill placed as CSBC below pavements and sidewalks should meet the requirements for Crushed Surfacing Base Course, Section 9-03.9(3) of the WSDOT Standard Specifications.

#### **4.7.8. On-Site Soil**

Based on our subsurface explorations and experience, it is our opinion that existing site soils will likely only be suitable for fill in non-structural areas and during periods of extended dry weather. The on-site soils may be considered for use as structural fill and trench backfill, provided they can be adequately moisture conditioned, placed and compacted as recommended and do not contain organic or other deleterious material.

The native glacial till soils at the site are primarily comprised of sandy silt and are extremely moisture sensitive. These soils will be very difficult or impossible to properly compact when wet and we do not recommend they be reused as structural fill during periods of wet weather. In addition, it is possible that existing soils will be generated at moisture contents above what is optimum for compaction. In this case, the soils would need to be moisture conditioned prior to re-use. Space for drying out material during dryer weather or covering on-site materials generated during wet weather should be considered. During wetter or even slightly colder times of year, such as when temperatures get below about 60 degrees, accommodations to cover stockpiled material generated on site that will be used as structural fill should be planned.

If earthwork occurs during a typical wet season, or if the soils are persistently wet and cannot be dried back due to prevailing wet weather conditions, we recommend the use of imported select granular fill, as described above.

#### **4.7.9. Fill Placement and Compaction**

To obtain proper compaction, fill soil should be compacted near optimum moisture content and in uniform horizontal lifts. Lift thickness and compaction procedures will depend on the moisture content and gradation characteristics of the soil and the type of equipment used. The maximum allowable moisture content varies with the soil gradation and should be evaluated during construction. Generally, 12-inch loose lifts are appropriate for steel-drum vibratory roller compaction equipment. Compaction should be achieved by mechanical means. During fill and backfill placement, sufficient testing of in-place density should be conducted by a representative of GeoEngineers to check that adequate compaction is being achieved.

##### **4.7.9.1. Area Fills and Pavement Bases**

Fill placed to raise site grades and materials under pavements and structural areas should be placed on subgrades prepared as previously recommended. Fill material placed below structures and footings should be compacted to at least 95 percent of the theoretical maximum dry density (MDD) per ASTM International (ASTM) D 1557. Fill material placed shallower than 2 feet below pavement sections should be compacted

to at least 95 percent of the MDD. Fill placed deeper than 2 feet below pavement sections should be compacted to at least 90 percent of the MDD. Fill material placed in landscaping areas should be compacted to a firm condition that will support construction equipment, as necessary, typically around 85 to 90 percent of the MDD.

#### **4.7.9.2. Backfill Behind Below-Grade Structures**

Backfill behind retaining walls or below-grade structures should be compacted to between 90 and 92 percent of the MDD. Overcompaction of fill placed directly behind below-grade structures should be avoided. We recommend use of hand-operated compaction equipment and maximum 6-inch loose lift thickness when compacting fill within about 5 feet behind below-grade structures.

#### **4.7.9.3. Trench Backfill**

For utility excavations, we recommend that the initial lift of fill over the pipe be thick enough to reduce the potential for damage during compaction, but generally should not be greater than about 18 inches above the pipe. In addition, rock fragments greater than about 1 inch in maximum dimension should be excluded from this lift.

Trench backfill material placed below structures and footings should be compacted to at least 95 percent of the MDD. In paved areas, trench backfill should be uniformly compacted in horizontal lifts to at least 95 percent of the MDD in the upper 2 feet below subgrade. Fill placed below a depth of 2 feet from subgrade in paved areas must be compacted to at least 90 percent of the MDD. In non-structural areas, trench backfill should be compacted to a firm condition that will support construction equipment, as necessary.

## **5.0 LIMITATIONS**

We have prepared this report for City of Mercer Island Public Works, for the Luther Burbank Park Upland Improvement Project. City of Mercer Island Public Works may distribute copies of this report to owner and owner's authorized agents and regulatory agencies as may be required for the Project.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices for geotechnical engineering in this area at the time this report was prepared. The conclusions, recommendations, and opinions presented in this report are based on our professional knowledge, judgment and experience. No warranty, express or implied, applies to the services or this report.

Please refer to Appendix B titled "Report Limitations and Guidelines for Use" for additional information pertaining to use of this report.







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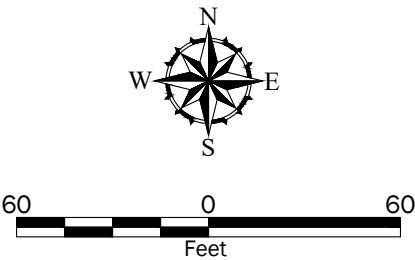


**Legend**

B-1  Boring by GeoEngineers, Inc., 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: Aerial from Google Earth Pro dated 08/14/2020.  
Projection: Washington State Plane, North Zone, NAD83, US Foot



Site Plan	
Luther Burbank Park Upland Improvements Mercer Island Washington	
	Figure 2





## **APPENDIX A**

### **Subsurface Explorations and Laboratory Testing**



## **APPENDIX A**

### **SUBSURFACE EXPLORATIONS AND LABORATORY TESTING**

#### **Subsurface Explorations**

##### **General**

Soil conditions at the project site were explored by advancing three borings on April 1, 2022. The approximate locations of our explorations are shown on Figure 2. The explorations were located in the field using a GPS device. The locations of the explorations shown on the Site Plan (Figure 2) should be considered approximate.

##### **Soil Borings**

Soil borings were advanced to between 11 feet and 13.5 feet below ground surface (bgs) using a track-mounted hollow-stem auger drill rig equipment and operators under subcontract to GeoEngineers. The explorations were continuously monitored by a representative from our firm who examined and classified the soil encountered, obtained representative soil samples, and maintained a detailed log of the explorations. Soil encountered in the borings was classified in general accordance with ASTM International (ASTM) D 2488 and the classification chart listed in Key to Exploration Logs, Figure A-1. Logs of the borings are presented in Figures A-2 through A-4. The logs are based on interpretation of the field and laboratory data and indicate the depth at which we interpret subsurface materials or their characteristics to change, although these changes might actually be gradual.

Soil samples were obtained from the borings at approximate 2.5- to 5-foot-depth intervals using either a 2-inch, outside-diameter, standard split-spoon sampler (Standard Penetration Test [SPT]) in general accordance with ASTM D 1586 or using a larger 2.4-inch-diameter sampler. The samplers were driven into the soil using a 140-pound rope and cathead hammer, free-falling 30 inches. The number of blows required to drive the samplers each of three, 6-inch increments of penetration were recorded in the field. The sum of the blow counts for the final 12 inches of penetration, unless otherwise noted, is reported on the boring logs.

##### **Laboratory Testing**

Soil samples obtained from the borings and test pits were returned to our laboratory for further examination and testing. The testing completed on each sample is presented in the corresponding boring log or test pit log.

Grain-size analyses were performed on selected soil samples in general accordance with ASTM Test Method D 6913. This test provides a quantitative determination of the distribution of particle sizes in soils. Figure A-5 presents the results of the grain-size analyses.

## SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS  (LITTLE OR NO FINES)		<b>GW</b>	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
		GRAVELS WITH FINES  (APPRECIABLE AMOUNT OF FINES)		<b>GP</b>	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
	SAND AND SANDY SOILS	CLEAN SANDS  (LITTLE OR NO FINES)		<b>GM</b>	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
		SANDS WITH FINES  (APPRECIABLE AMOUNT OF FINES)		<b>GC</b>	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
		CLEAN SANDS  (LITTLE OR NO FINES)		<b>SW</b>	WELL-GRADED SANDS, GRAVELLY SANDS
		SANDS WITH FINES  (APPRECIABLE AMOUNT OF FINES)		<b>SP</b>	POORLY-GRADED SANDS, GRAVELLY SAND
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		<b>ML</b>	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
				<b>CL</b>	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				<b>OL</b>	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		<b>MH</b>	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
				<b>CH</b>	INORGANIC CLAYS OF HIGH PLASTICITY
				<b>OH</b>	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS				<b>PT</b>	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	
	<b>AC</b>	Asphalt Concrete
	<b>CC</b>	Cement Concrete
	<b>CR</b>	Crushed Rock/Quarry Spalls
	<b>SOD</b>	Sod/Forest Duff
	<b>TS</b>	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

Drilled	Start 4/1/2022	End 4/1/2022	Total Depth (ft)	13.5	Logged By Checked By	LSP BEL	Driller	Geologic Drill Technologies	Drilling Method	Hollow-stem Auger
Surface Elevation (ft) Vertical Datum	23 NAVD88			Hammer Data	Rope & Cathead 140 (lbs) / 30 (in) Drop			Drilling Equipment	Mini Track Rig	
Easting (X) Northing (Y)	1297163 218603			System Datum	WA State Plane South NAD83 (feet)			Groundwater not observed at time of exploration		
Notes:										

Elevation (feet)	Depth (feet)	FIELD DATA				Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
		Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing						
0							ML	Dark brown sandy silt with organics (stiff, moist) (sod)			
							ML	Gray sandy silt with occasional oxidation staining (hard, moist) (glacial till)			
20		<div></div>	34		1 SA				13	67	
5		<div></div>	55		2						
15		<div></div>	50/5"		3						
						<div></div>	SM	Gray silty fine sand (very dense, moist)			
10		<div></div>	50/6"		4						
		<div></div>	71		5 SA		ML	Gray silt with sand (hard, moist)	16	74	
		<div></div>	86		6						
10		<div></div>									

Practical drilling refusal at 13½ feet

Note: See Figure A-1 for explanation of symbols.  
Coordinates Data Source: Horizontal approximated based on Esri Survey. Vertical approximated based on Project Survey.

### Log of Boring B-1



Project: Luther Burbank Park Upland Improvements  
Project Location: Mercer Island, Washington  
Project Number: 0817-024-01

Figure A-2  
Sheet 1 of 1

Drilled	Start 4/1/2022	End 4/1/2022	Total Depth (ft)	11	Logged By Checked By	LSP BEL	Driller	Geologic Drill Technologies	Drilling Method	Hollow-stem Auger
Surface Elevation (ft) Vertical Datum	20 NAVD88			Hammer Data	Rope & Cathead 140 (lbs) / 30 (in) Drop			Drilling Equipment	Mini Track Rig	
Easting (X) Northing (Y)	1297149 218583			System Datum	WA State Plane South NAD83 (feet)			Groundwater not observed at time of exploration		
Notes:										

[illegible]

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### Practical drilling refusal at 11 feet

Note: See Figure A-1 for explanation of symbols.  
Coordinates Data Source: Horizontal approximated based on Esri Survey. Vertical approximated based on Project Survey.

## Log of Boring B-2



Project: Luther Burbank Park Upland Improvements  
Project Location: Mercer Island, Washington  
Project Number: 0817-024-01

Figure A-3  
Sheet 1 of 1

Drilled	Start 4/1/2022	End 4/1/2022	Total Depth (ft)	11.5	Logged By Checked By	LSP BEL	Driller	Geologic Drill Technologies	Drilling Method	Hollow-stem Auger	
Surface Elevation (ft) Vertical Datum			20 NAVD88		Hammer Data		Rope & Cathead 140 (lbs) / 30 (in) Drop		Drilling Equipment		Mini Track Rig
Easting (X) Northing (Y)			1297142 218689		System Datum		WA State Plane South NAD83 (feet)		See "Remarks" section for groundwater observed		
Notes:											

Elevation (feet)	Depth (feet)	FIELD DATA				Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
		Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing						
0							CC	Approximately 6 inches concrete			
	12	14			1		SPSM	Approximately 4 inches gray fine to coarse sand with silt (medium dense, moist) (base course)			
							ML	Gray sandy silt with gravel (stiff, moist) (fill)			
	15	WOH			2			Becomes wet			No sheen, slight odor Perched groundwater observed at approxiamtely 3 feet during drilling
5	16	46			3						Slight sheen, slight odor
	18	60			4		ML	Light brown sandy silt (hard, moist) (glacial till)			No sheen, no odor
10	16	60			5						No sheen, no odor

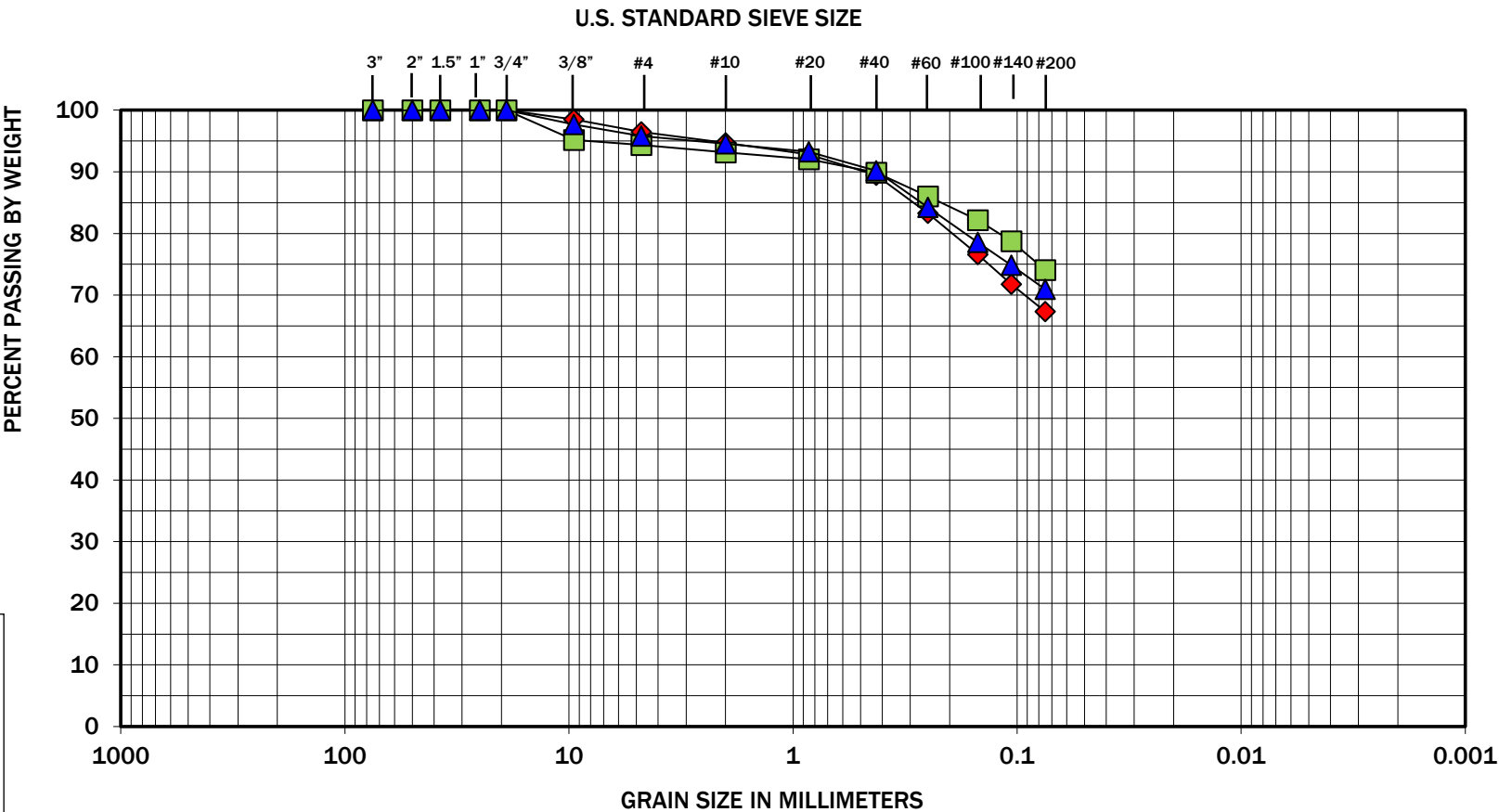
Note: See Figure A-1 for explanation of symbols.  
Coordinates Data Source: Horizontal approximated based on Esri Survey. Vertical approximated based on Project Survey.

### Log of Boring B-3



Project: Luther Burbank Park Upland Improvements  
Project Location: Mercer Island, Washington  
Project Number: 0817-024-01

Figure A-4  
Sheet 1 of 1



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Symbol	Boring Number	Depth (feet)	Moisture (%)	Soil Description
◆	B-1	2.5	13	Sandy silt (ML)
■	B-1	10.5	16	Silt with sand (ML)
▲	B-2	2.5	14	Silt with sand (ML)



Note: This report may not be reproduced, except in full, without written approval of GeoEngineers, Inc. Test results are applicable only to the specific sample on which they were performed, and should not be interpreted as representative of any other samples obtained at other times, depths or locations, or generated by separate operations or processes.

The grain size analysis results were obtained in general accordance with ASTM C 136. GeoEngineers 17425 NE Union Hill Road Ste 250, Redmond, WA 98052

**GEOENGINEERS**

**Figure-A-5**

**Sieve Analysis Results**

Luther Burbank Park Upland Improvements  
Mercer Island, Washington

## **APPENDIX B**

### **Report Limitations and Guidelines for Use**

## **APPENDIX B**

### **REPORT LIMITATIONS AND GUIDELINES FOR USE<sup>1</sup>**

This appendix provides information to help you manage your risks with respect to the use of this report.

#### **Read These Provisions Closely**

It is important to recognize that the geoscience practices (geotechnical engineering, geology and environmental science) rely on professional judgment and opinion to a greater extent than other engineering and natural science disciplines, where more precise and/or readily observable data may exist. To help clients better understand how this difference pertains to our services, GeoEngineers includes the following explanatory “limitations” provisions in its reports. Please confer with GeoEngineers if you need to know more how these “Report Limitations and Guidelines for Use” apply to your project or site.

#### **Geotechnical Services are Performed for Specific Purposes, Persons and Projects**

This report has been prepared for City of Mercer Island Public Works and for the Project(s) specifically identified in the report. The information contained herein is not applicable to other sites or projects.

GeoEngineers structures its services to meet the specific needs of its clients. No party other than the party to whom this report is addressed may rely on the product of our services unless we agree to such reliance in advance and in writing. Within the limitations of the agreed scope of services for the Project, and its schedule and budget, our services have been executed in accordance with our Agreement with City of Mercer Island Public Works dated January 4, 2022 and generally accepted geotechnical practices in this area at the time this report was prepared. We do not authorize, and will not be responsible for, the use of this report for any purposes or projects other than those identified in the report.

#### **A Geotechnical Engineering or Geologic Report is based on a Unique Set of Project-Specific Factors**

This report has been prepared for the Luther Burbank Upland Improvements Project in Mercer Island, 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, it is important not to 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;

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<sup>1</sup> Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; [www.asfe.org](http://www.asfe.org).



- elevation, configuration, location, orientation or weight of the proposed structure;
- composition of the design team; or
- project ownership.

If changes occur after the date of this report, GeoEngineers cannot be responsible for any consequences of such changes in relation to this report unless we have been given the opportunity to review our interpretations and recommendations. Based on that review, we can provide written modifications or confirmation, as appropriate.

### **Environmental Concerns are Not Covered**

Unless environmental services were specifically included in our scope of services, this report does not provide any environmental findings, conclusions, or recommendations, including but not limited to, the likelihood of encountering underground storage tanks or regulated contaminants.

### **Information Provided by Others**

GeoEngineers has relied upon certain data or information provided or compiled by others in the performance of our services. Although we use sources that we reasonably believe to be trustworthy, GeoEngineers cannot warrant or guarantee the accuracy or completeness of information provided or compiled by others.

### **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 man-made events such as construction on or adjacent to the site, new information or technology that becomes available subsequent to the report date, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. If more than a few months have passed since issuance of our report or work product, or if any of the described events may have occurred, please contact GeoEngineers before applying this report for its intended purpose so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

### **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 the specific subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied its professional judgment to render an informed opinion about subsurface conditions at other locations. Actual subsurface conditions may differ, sometimes significantly, from the opinions presented in this report. Our report, conclusions and interpretations are not a warranty of the actual subsurface conditions.

### **Geotechnical Engineering Report Recommendations are Not Final**

We have developed the following recommendations based on data gathered from subsurface investigation(s). These investigations sample just a small percentage of a site to create a snapshot of the subsurface conditions elsewhere on the site. Such sampling on its own cannot provide a complete and accurate view of subsurface conditions for the entire site. Therefore, the recommendations included in this

report are preliminary and should not be considered final. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers cannot assume responsibility or liability for the recommendations in this report if we do not perform construction observation.

We recommend that you allow sufficient monitoring, testing and consultation during construction by GeoEngineers to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes if the conditions revealed during the work differ from those anticipated, and to evaluate whether earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective means of managing the risks associated with unanticipated conditions. If another party performs field observation and confirms our expectations, the other party must take full responsibility for both the observations and recommendations. Please note, however, that another party would lack our project-specific knowledge and resources.

### **A Geotechnical Engineering or Geologic Report Could Be Subject to Misinterpretation**

Misinterpretation of this report by members of the design team or by contractors can result in costly problems. GeoEngineers can help reduce the risks of misinterpretation by conferring with appropriate members of the design team after submitting the report, reviewing pertinent elements of the design team's plans and specifications, participating in pre-bid and preconstruction conferences, and 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. The logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Photographic or electronic reproduction is acceptable, but separating logs from the report can create a risk of misinterpretation.

### **Give Contractors a Complete Report and Guidance**

To help reduce the risk of problems associated with unanticipated subsurface conditions, GeoEngineers recommends giving contractors the complete geotechnical engineering or geologic report, including these "Report Limitations and Guidelines for Use." When providing the report, you should preface it with a clearly written letter of transmittal that:

- advises contractors that the report was not prepared for purposes of bid development and that its accuracy is limited; and
- encourages contractors to confer with GeoEngineers and/or to conduct additional study to obtain the specific types of information they need or prefer.

### **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 adjacent properties.

## **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.

A Client that desires these specialized services is advised to obtain them from a consultant who offers services in this specialized field



# **Dive Survey – Field Notes**

**APPENDIX**  
**DIVE SURVEY – FIELD NOTES**

A dive survey was conducted on May 28, 2025 to determine an approximate amount of in-water rubbish for removal during construction. Please refer to Specification 02 41 13 Site Demolition for more information.

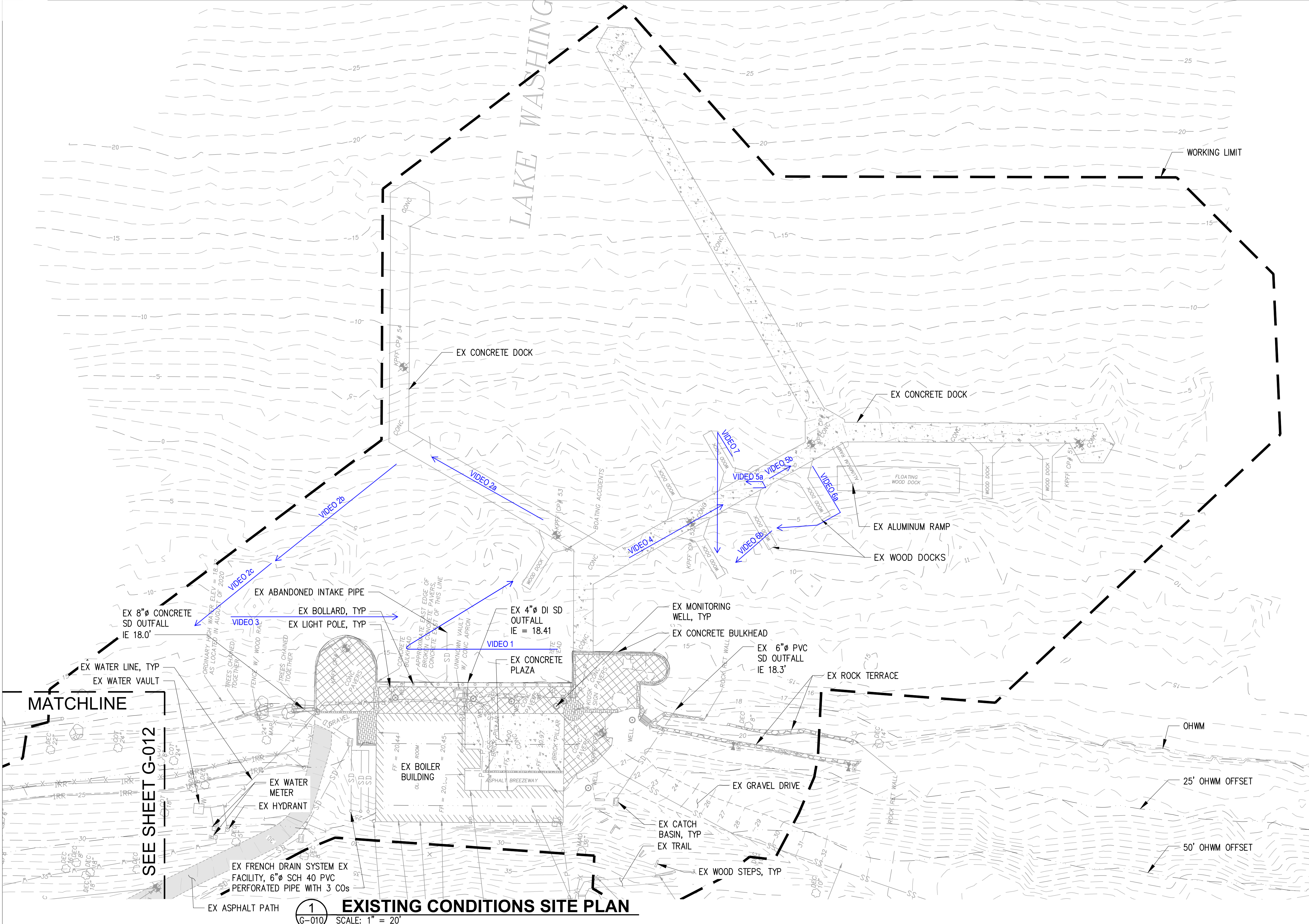
Several video files were produced that show an assortment of in-water rubbish (debris) on the lakebed such as, bricks, concrete chunks, lumber, timbers and piles; large rocks and boulders; aluminum, plastic, and glass containers; lawn chairs; and at least one rubber tire. The approximate swim paths used for video collection are shown on the following sheet.

Handwritten field notes are also included that show the approximate location and distribution of some of the debris.

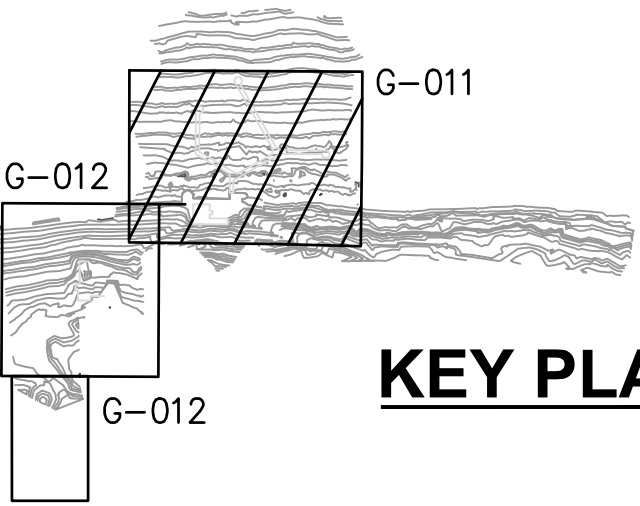
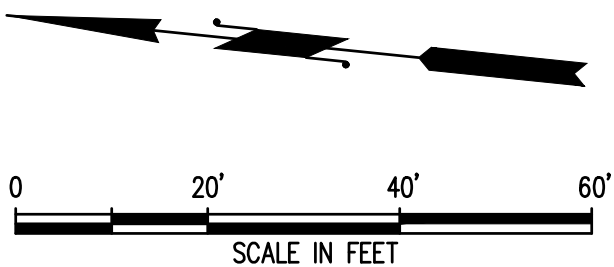
The corresponding video files are available for download and viewing from the following FTP site:  
<https://liquidfiles.mercergov.org/shares/lbwi-specs/folders/lbwi-dive-survey-videos>

Login password is: *Luther*





- LEGEND:**
- PROJECT WORK AREA LIMIT
  - OHWM AND SHORELINE SETBACKS
  - EX PERVIOUS PAVERS
  - EX BRICK
  - EX ASPHALT PATH
  - EX CONCRETE
  - EX BUILDING
  - EX BOULDER
  - EX TREE
  - EX LARGE WOODY DEBRIS
  - EX CATCH BASIN
  - EX LUMINARE
  - EX UNDERGROUND POWER
  - EX STORM LINE
  - EX WATER LINE
  - EX SEWER LINE
  - EX IRRIGATION LINE
  - EX FENCE
  - EX GAS LINE
  - EX UNDERGROUND COMMUNICATIONS
  - SURVEY CONTROL POINT (SEE SURVEY)
  - MAJOR CONTOUR
  - MINOR CONTOUR



**LUTHER BURBANK PARK  
WATERFRONT IMPROVEMENTS  
EXISTING CONDITIONS SITE PLAN  
WATERFRONT**

DRAWN:	PROJECT NO.: 2200248
DESIGN:	SCALE: 1" = 20'
CHECKED:	DATE: 2/4/2026
DRAWING NO.	
SHEET NO. OF	



# kpff

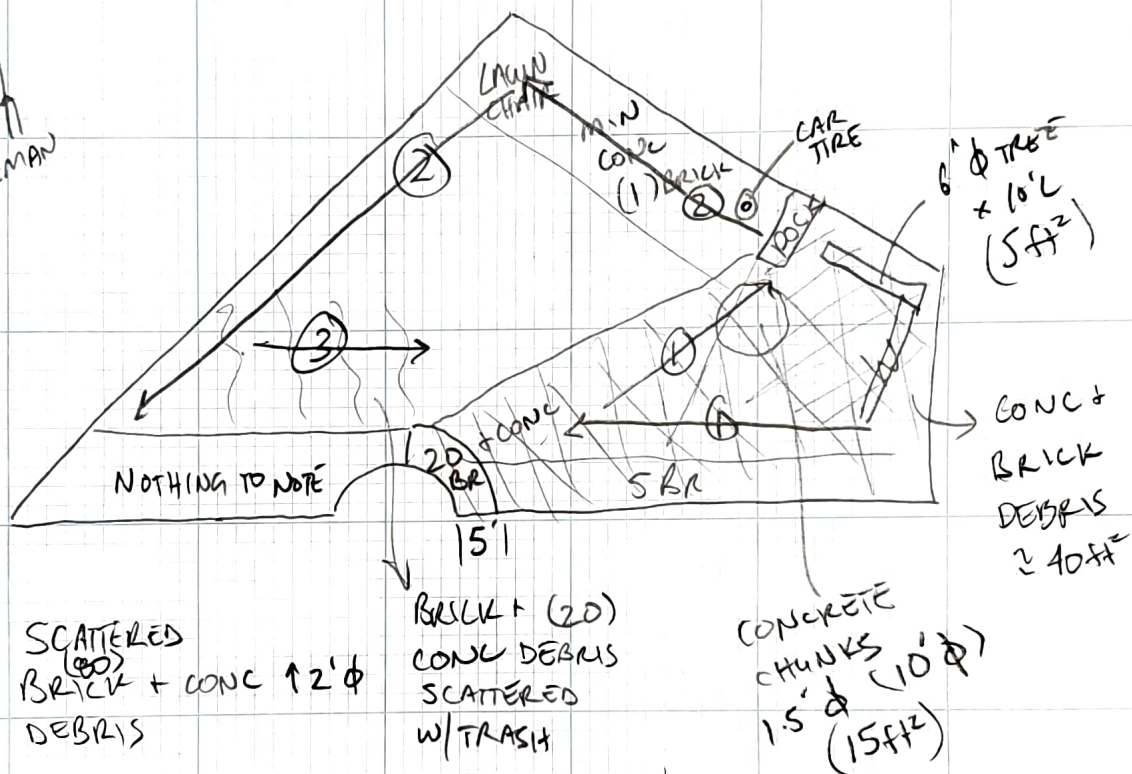
project LUTHER BURRANK  
location MERCER ISLAND, WA  
client

by AWE  
date 05/28/25

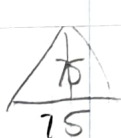
sheet no.  
1  
job no.

10:41 → DIVER IN GYT

LAWN CHAIR  
COLEMAN



→ Gopro



$$\left(\frac{1}{2} \times 75 \times \frac{75}{2}\right) \times 2 = 2812.5 \times 30\% = 843.75 \text{ ft}^2 \approx 900 \text{ ft}^2$$

