PROJECT MANUAL
FOR

SALMON HARBOR MARINA
RV EXPANSION

SITE WORK
FOR

SALMON HARBOR MANAGEMENT COMMITTEE
DOUGLAS COUNTY
P.O. BOX 1007 / 100 ORK ROCK ROAD
WINCHESTER BAY, OR 97467

MAY 2019
PROJECT #15.68
SECTION 00-0101
PROJECT TITLE PAGE

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SALMON HARBOR MARINA - RV EXPANSION
SITE WORK

SALMON HARBOR MANAGEMENT COMMITTEE /
DOUGLAS COUNTY
P.O. BOX 1007 / 100 ORK ROCK ROAD
WINCHESTER BAY, OREGON 97467

PREPARED BY:

HGE, INC., ARCHITECTS, ENGINEERS & PLANNERS
333 SOUTH 4TH STREET
COOS BAY, OREGON 97420
(541)269-1166
SECTION 00-0110
TABLE OF CONTENTS

PROCUREMENT AND CONTRACTING REQUIREMENTS

1.01 DIVISION 00 -- PROCUREMENT AND CONTRACTING REQUIREMENTS
   A. 00-0101 - Project Title Page
   B. 00-0110 - Table of Contents
   C. 00-1113 - Advertisement for Bids
   D. 00-2113 - Instructions to Bidders
   E. Substitution Request Form
   F. Bid Form
   G. Bid Bond
   H. First-Tier Subcontractor Disclosure Form
   I. Contract Agreement
   J. Supplemental Contract Terms
   K. Employee Drug Testing Program Certification Form
   L. Performance Bond Form
   M. Payment Bond
   N. Payment of Prevailing Wage Rates
   O. General Conditions for Construction Contracts
   P. 00-5300 – Contract Modification Procedures
   Q. Contract Forms

1.02 DC – DESIGN CRITERIA

SPECIFICATIONS

2.01 DIVISION 01 -- GENERAL REQUIREMENTS
   A. 01-1000 - Summary
   B. 01-2300 - Alternates
   C. 01-3000 – Administrative Requirements
   D. 01-4000 – Quality Requirements
   E. 01-4523 – Compaction Testing
   F. 01-5000 - Temporary Facilities and Controls
   G. 01-5050 - Mobilization
   H. 01-5713 – Temporary Erosion and Sediment Control
   I. 01-6000 – Product Requirements
   J. 01-7000 – Execution and Closeout Requirements
   K. 01-7419 – Construction Waste Management and Disposal
L.  01-7800 – Closeout Submittals

**2.02 DIVISION 26 – ELECTRICAL**
A.  26-0500 – Basic Electrical Materials & Methods  
B.  26-0519 – Conductors and Cables  
C.  26-0526 – Grounding and Bonding  
D.  26-0533 – Raceways and Boxes  
E.  26-5100 – Lighting Fixtures

**2.03 DIVISION 31 -- EARTHWORK**
A.  31-1000 - Site Clearing  
B.  31-2200 - Grading  
C.  31-2316 - Excavating  
D.  31-2316.13 - Trenching  
E.  31-2319 - Dewatering  
F.  31-2323 – Fill  
G.  31-3700 – Riprap or Rock Lining  
H.  31-4100 - Shoring

**2.04 DIVISION 32 -- EXTERIOR IMPROVEMENTS**
A.  32-1123 - Aggregate Base Courses  
B.  32-1216 - Asphalt Paving  
C.  32-1313 – Concrete Paving  
D.  32-1700 - Pavement Specialties  
E.  32-1713 - Parking Bumpers  
F.  32-1723 – Pavement Markings  
G.  32-1726 – Tactile Warning Surface  
H.  32-8423 – Landscape Irrigation  
I.  32-9200 - Seeding  
J.  32-9300 - Plants

**2.05 DIVISION 33 -- UTILITIES**
A.  33-0513 - Manholes and Structures  
B.  33-1113 - Water Utility and Distribution Piping  
C.  33-1200 - Water Utility Distribution Equipment  
D.  33-1300 - Disinfecting of Water Utility Distribution  
E.  33-3113 - Sanitary Utility Sewerage Piping  
F.  33-4113 - Storm Drain Pipe and Fittings  
G.  33-4400 - Storm Drain Structures and Appurtenances

**2.06 DIVISION 34 - SIGNS**
A.  34-4113.10 - Metal Sign Supports  
B.  34-4113.20 - Signs

END OF TABLE OF CONTENTS
ADVERTISEMENT FOR BIDS

Notice is hereby given that sealed bids for Salmon Harbor Marina’s RV Resort Expansion - Site Work will be received by the Salmon Harbor Management Committee (SHMC) until the bid closing time of **2:00 P.M., Local Time, Thursday, July 18, 2019** at the Salmon Harbor Marina Office, 100 Ork Rock Road, Winchester Bay, OR 97467; mailing address is P.O. Box 1007, Winchester Bay, OR 97467. Bids will be publicly opened and read aloud during a scheduled SHMC meeting, which will be held on July 18, 2019 at 2:30 P.M. at the Winchester Bay RV Resort Marina Activity Center, located within the Salmon Harbor Marina complex, 263 Marina Way, Winchester Bay, Oregon. Refer to the Instructions to Bidders within the Bidding Documents for more information.

Work on this contract consists of all site improvements to accommodate a 40-full hookup RV site on an undeveloped parcel of Salmon Harbor property, located on the west spit. Site improvements include clearing, grading, paving, pedestrian walks, sanitary sewer, waterlines, storm drainage improvements, electrical, other utility connections, landscape irrigation, seeding, and other work as described in the construction documents. This work is in conjunction with the Restroom/Shower/Laundry Building construction and the contractor selected by the SHMC will be required to coordinate and cooperate with the building contractor as the work will occur concurrently. All building site work as delineated on the drawings will be by site contractor.

Bidders must view and obtain solicitation documents from the Douglas County website’s “Bid Documents” webpage: http://www.co.douglas.or.us/Bid_Documents. It is the bidder’s responsibility to monitor the website. Contract Documents for this work, including the Instructions to Bidders and Bid Form, may be examined at the following locations: (1) Salmon Harbor Marina Office, 100 Ork Rock Road, Winchester Bay, Oregon 97467; (2) the office of the Architect, HGE INC., Architects, Engineers & Planners, 333 South 4th Street, Coos Bay, Oregon, phone: 541-269-1166, email: general@hge1.com; (3) various Plan Centers throughout the region; and (4) HGE website: http://www.hge1.com/open-to-bid/. General Contractors are encouraged to contact HGE, INC., by phone or email and register their interest in submitting a bid and to be included in the plan holders’ list. Contractors and sub-contractors that are registered on the plan holders list will receive all bidding information, including any issued addendums.

One set of drawings, specifications and contract documents may be obtained by prime bidders from HGE, INC., upon a refundable deposit of $100.

This project is a public work as defined by ORS 279C.800(6)(a). No bid will be received or considered unless the bid states that the bidder will comply with ORS 279C.800 to 279C.870 concerning payment of prevailing wage rates for public works contracts and unless the bid is accompanied by a surety bond of 10% of the amount bid. Per ORS 279C.385, bid security is to be forfeited as fixed and liquidated damage should the bidder neglect or refuse to enter into a contract and provide suitable insurance certificates, bonds and other required documents for the faithful performance of the work in the event bidder is awarded the contract. No bids will be considered unless fully completed in the manner provided in the Instructions to Bidders upon the
official bid form provided by the Salmon Harbor Management Committee, within the Project Manual.

Pursuant to ORS 279C.836, the contractor and every subcontractor must have a public works bond in the amount of $30,000.00 filed with the Construction Contractors Board before starting work on the project, unless exempt under ORS 279C.836 (7) or (8).

No bid will be received or considered unless the bidder is registered with the Construction Contractor’s Board pursuant to ORS Chapter 701. A license to perform landscaping work issued by the State Landscape Contractors Board is required. A license for abatement of asbestos issued pursuant to ORS 468A.720 et seq. is not required. A bid must include a statement on whether or not the bidder is a “resident bidder” as defined in ORS 279A.120.

Bidder must prequalify with the SHMC under ORS 279C.430. See Instructions to Bidders for more information.

A Mandatory pre-bid meeting and walk-through of the project will be held at 1:30 P.M. Local Time on Thursday, June 27, 2019. Contractors shall meet at the Winchester Bay RV Resort Marina Activity Center, 263 Marina Way, Winchester Bay, Oregon to review project scope, bidding requirements, and other items. A tour and walk-through of the project site will immediately follow. The pre-bid meeting and walk-through are mandatory for general contractor bidders.

In accordance with ORS 279C.370, within two (2) working hours after the date and time of the deadline when the bids are due to the SHMC, a bidder shall submit to the Bidding Coordinator a disclosure of the first-tier subcontractors that will be furnishing labor or will be furnishing labor and materials in connection with this public improvement; and that will have a contract value that is equal to or greater than five percent (5%) of the total project bid or $15,000, whichever is greater, or $350,000 regardless of the percentage of the total project bid. The disclosure of first-tier subcontractors shall include the name of each subcontractor, the category of work that each subcontractor will perform and the dollar value of each subcontract.

The SHMC reserves the right to reject any or all bids, to waive technicalities, and to award the contract to the lowest responsive responsible bidder. The SHMC may reject any bid not in compliance with all prescribed public contracting procedures and requirements and may reject all bids upon a finding that it is in the public interest to do so. No bidder may withdraw its bid after the hour set for the opening thereof until the lapse of thirty (30) days from the bid opening.

By: Paul Stallard, Harbor Manager
Salmon Harbor Marina – Winchester Bay RV Resort
Published:

The World Newspaper
Coos Bay, Oregon
Date: June 20, 2019

Daily Journal of Commerce
Portland, Oregon
Date: June 21, 2019

The News Review
Roseburg, Oregon
Date: June 20, 2019

The Register-Guard
Eugene, Oregon
Date: June 20, 2019
INSTRUCTIONS TO BIDDERS
SALMON HARBOR MANAGEMENT COMMITTEE
SALMON HARBOR MARINA RV RESORT EXPANSION
SITE WORK

Douglas County (the County), acting by and through the Salmon Harbor Management Committee (SHMC) is seeking Bids for SALMON HARBOR MARINA RV RESORT EXPANSION.

SITE WORK

Work on this contract consists of all site improvements to accommodate a 40-full hookup RV site on an undeveloped parcel of Salmon Harbor property, located on the west spit. Site improvements include clearing, grading, paving, pedestrian walks, sanitary sewer, storm drainage improvements, electrical, other utility connections, landscape irrigation, seeding, and other work as described in the construction documents. This work is in conjunction with the Restroom/Shower/Laundry Building construction. The contractor selected by the SHMC will be required to coordinate and cooperate with the building contractor as the work will occur concurrently. All building site work as delineated on the drawings will be by site contractor.

The construction timeline is: Start August 19, 2019 and be completed by March 8, 2020. Once construction has begun, the Contractor must maintain continuous work to ensure the Project is completed prior to or on March 8, 2020.

Bids will be subject to the following conditions:

1  DEFINITIONS AND INTERPRETATION: Refer to the “Salmon Harbor Management Committee General Conditions for Construction Contracts” for definitions of terms used within these instructions.

2  CONDITIONS THAT AFFECT THE WORK:

2.1. The Bidding Document may include documents within the possession of the SHMC that contain information concerning physical conditions that a Bidder may encounter while performing the Work. Such information may not be complete or accurate. DOUGLAS COUNTY, THE PORT OF UMPQUA (the Port), AND THE SHMC MAKE NO WARRANTIES CONCERNING SUCH INFORMATION.

2.2. Before submitting the Bid a Bidder shall:

2.2.1. Ascertain conditions at the Work Site that may affect the Work;
2.2.2. Ascertain the availability of labor, equipment, and materials that are necessary to perform the Work; and

2.2.3. Correlate the Bidding Requirements with the Bidder’s knowledge of conditions that may affect the Work.

2.3. Failure to take the precautions described in Subsection 2.2 will not invalidate a Bid or excuse the Bidder from complying with the Contract Documents. By submitting a Bid the Bidder will be deemed to waive any claims based on unforeseen conditions that will affect the Work or deficiencies in information described in Subsection 2.1.

3 ADMINISTRATION OF THE BIDDING PROCESS:

3.1. Paul Stallard, Harbor Manager, is the Contract Administrator. The Consultant, HGE, INC. Architects, Engineers and Planners, will administer the bidding process for the SHMC. Questions, objections to the provisions of the Bidding Documents, and other correspondence regarding the Bidding Requirements must be directed to the Consultant. Bidders should not communicate with any other officers, employees, or agents of the County, the Port, or the SHMC regarding the Bidding Requirements unless referred by the Contract Administrator. The Consultant’s address and telephone number are 333 South 4th, Coos Bay, Oregon 97420, (541) 269-1166.

4 OBJECTIONS AND QUESTIONS:

4.1. A Bidder who contends that the Bidding Documents encourage favoritism or substantially diminish competition for the Contract may submit a written objection to the provisions of the Bidding Documents no later than ten (10) days before Bids are due. A Bidder who fails to submit a timely objection cannot subsequently claim that the Bidding Requirements are invalid or violate any provision of law or this Request for Bids.

4.2. A Bidder should not overlook discrepancies in the Bidding Documents or draw inferences concerning any part of the Bidding Documents that the Bidder deems unclear. Any questions concerning the Bidding Documents must be submitted to the Consultant no later than ten (10) days before Bids are due.

4.3. The SHMC and/or the Harbor Manager reserves exclusive discretion to determine whether a question or an objection by a prospective Bidder justifies clarification or corrective action. In consultation with the Harbor Manager, the Consultant will endeavor to reply to all timely questions and objections, but unless an addendum or written reply is issued, objections will be deemed overruled and questions will be deemed immaterial. Objections and questions that are not submitted to the Consultant within the time allowed by this section will not be considered.
5 SCHEDULE OF EVENTS: The following schedule of events shall be followed:

5.1 Release and Advertisement June 20 & 21, 2019
5.2 Pre-Bid Conference/Walkthrough June 27, 2019
5.3 Written questions and requests for clarifications July 8, 2019
5.4 Deadline to protest Bidding Document July 8, 2019 provisions
5.5 Bid Closing July 18, 2019, 2:00 PM
5.6 Bid Opening July 18, 2019, 2:30 PM
5.7 Contractor award July 25, 2019
5.8 Issuance of intent to award contract July 25, 2019
5.9 Deadline to protest intended award July 30, 2019
5.10 Contract execution complete by August 14, 2019
5.11 Issue Notice to Proceed August 19, 2019

The SHMC and/or the Harbor Manager reserves the right to change the foregoing schedule as it deems necessary or appropriate.

6 ADDENDA: The provisions of the Bidding Documents cannot be modified by oral interpretations or statements, which shall be deemed inadmissible in any protest proceedings. If inquiries or comments by Bidders, or prospective Bidders, raise issues that require clarification by the SHMC and/or the Harbor Manager, or if the SHMC and/or the Harbor Manager elect to revise or modify the any part of the Bidding Documents, the Harbor Manager will issue an Addendum on the Douglas County website’s “Bid Documents” webpage, which may be found at: http://www.co.douglas.or.us/Bid_Documents/default.asp. Bidders are advised that no other source is authorized to given information concerning, or to explain or interpret, the Bidding Documents except the Consultant and/or the Harbor Manager.

The Harbor Manager and/or the Consultant will also issue the Addendum to all persons and entities that are known by the Harbor Manager and/or the Consultant to have received the Bidding Documents. Prior to preparing a Bid, a Bidder should verify that it has received all Addenda issued with this Request for Bids. It shall be Bidders’ responsibility to monitor the “Bid Documents” web page regularly while this Bid process is open for addenda and other notices provided in connection with this Bid process.

7 SUBSTITUTIONS:

7.1 The SHMC and/or the Harbor Manager reserve the right to specify Proprietary Products and Sole Source Products and to restrict substitution in accordance with Douglas County’s Local Contract Review Board Rules and other applicable laws.
7.2. Unless the Specifications state otherwise, descriptions of Proprietary Products or Sole Source Products in the Specifications establish the type, function, and quality of the product required for the work. A Bidder may submit a written request for approval of a Substitute to the Contract Administrator no later than ten (10) days before Bids are due. The request shall include the following information:

7.2.1. Technical characteristics of the Substitute;
7.2.2. Past performance and reliability of the Substitute when used for purposes similar to the intended use for the Specified Product;
7.2.3. Advantages and disadvantages of using the Substitute in comparison with the Specified Product;
7.2.4. Changes in the Work and changes in the Contract Time that would be necessary to use the Substitute;
7.2.5. Costs of providing, using, and maintaining the Substitute; and
7.2.6. Warranties, requirements for maintenance of the Substitute, and availability of maintenance and repair service.

7.3. The Harbor Manager may request additional information that the Harbor Manager deems necessary for evaluation of the proposed Substitute.

7.4. By requesting approval of a Substitute, the Bidder will be deemed to certify that the Substitute is suitable for the intended use of the Proprietary Product or Sole Source Product, will function as well as the Proprietary Product or Sole Source Product, and has been in use without apparent defects for the time and under the conditions required for the Work.

7.5. Although the Contract Documents may allow Substitutes, Bidders should make foreseeable requests for substitution under this section to promote fair comparison of Bids. Substitutions that are requested after the Agreement is signed shall be subject to Section 00120.16 of the 2018 Standard Specifications for Construction.

7.6. The SHMC and/or the Harbor Manager has exclusive discretion to determine whether proposed Substitutes comply with the Specifications. An addendum will be issued to identify any Substitute that the SHMC and/or the Harbor Manager approves.

8 QUALIFICATIONS:

8.1 Either the Bidder or a Contractor engaged by the Bidder to perform the Work must be registered with the Construction Contractor’s Board pursuant to ORS Ch. 701 and must be qualified to perform the Work under the criteria stated in ORS 279C.375, and any other Applicable Laws.
8.2 Bidder must prequalify with the SHMC under ORS 279C.430, on Standard ODOT Prime Contractor Prequalification Application, for the class or classes of work required on the project ten (10) days prior to bid opening. Prequalification Application may be obtained from ODOT’s website. The application should be submitted to the SHMC via the Consultant.

8.3 The SHMC and/or the Harbor Manager may make such investigations as deemed necessary to determine the ability of the Bidder to perform the work, and the Bidder shall furnish to the SHMC and/or the Harbor Manager all such information and data for this purpose as the SHMC and/or the Harbor Manager may request. The SHMC reserves the right to reject any bid if the evidence submitted by, or investigation of such Bidder fails to satisfy the SHMC that such Bidder is properly qualified to carry out the obligations of the Contract and to properly complete the Work contemplated therein.

8.4 Bidders which are not qualified will be notified within thirty (30) days after Consultant’s receipt of the Prequalification Application, and/or at least four (4) days prior to the bid opening date.

8.5 No Bid will be received from a Bidder who has not prequalified.

9 COLLUSION: No Bidder may participate in more than one Bid or engage in collusion with any other Bidders or prospective Bidders to gain an unfair advantage. Collusion includes any material action by a Bidder to influence the Bid Price proposed by another Bidder or to induce a prospective Bidder to refrain from bidding.

10 CANCELLATION OF BIDDING PROCESS: The SHMC may cancel the bidding process at any time if the SHMC determines that cancellation would be in the public interest.

11 COST OF BID PREPARATION: The County, the Port, and/or the SHMC will not reimburse any Bidder for costs incurred in preparation of a Bid.

12 FORM AND CONTENT OF BIDS:

12.1 A Bidder must complete the entire Bid Form. The Bid must be itemized with a total Bid amount for the entire project. All Bids MUST incorporate payment of labor at Prevailing Wage Rates. All blank spaces must be filled with entries that are printed in ink or typed. Erasures and corrections of entries must be initialed by the person who signs the Bid.

12.2 A Bidder must acknowledge receipt of each Addendum by inserting the number of the Addendum in the Bid Form. Failure to do so may result in Bid disqualification.
12.3. A Bidder must disclose on the Bid Form whether they are or are not a “resident bidder” as defined in ORS 279A.120: A “resident bidder” means a bidder that has paid unemployment taxes or income taxes in this state during the 12 calendar months immediately preceding submission of the bid, has a business address in this state and has stated in the bid whether the bidder is a “resident bidder.”

12.4. A Bidder shall not alter the Bidding Documents, disclaim or contradict any Bidding Requirements, or submit a Bid that is subject to conditions that are not allowed by the Bidding Requirements.

12.5. A Bid must be signed in ink, and the name and title of the person signing the Bid must be typed or printed below the signature.

12.6. First-tier Subcontractors: Within two (2) working hours after the date and time of the deadline when the Bids are due to the SHMC for this public improvement, a Bidder shall submit to the SHMC a disclosure of the first-tier subcontractors that will be furnishing labor or will be furnishing labor and materials in connection with the public improvement; and that will have a contract value that is equal to or greater than five percent (5%) of the total project bid or $15,000, whichever is greater, or $350,000 regardless of the percentage of the total project bid. The disclosure of first-tier subcontractors shall include the name of each subcontractor, the category of work that each subcontractor will perform and the dollar value of each subcontract. Enter “NONE” if there are no subcontractors that need to be disclosed. Failure to submit this form by the disclosure deadline will result in a nonresponsive bid. A nonresponsive bid will not be considered for award.

12.7. A Bid must state the legal name and business address of the Bidder and the name, address, and telephone number of a representative of the Bidder who is authorized to communicate with the Contract Administrator.

12.8. A Bid must state the registration number issued by the Construction Contractors Board and the expiration date for either the Bidder or the Contractor that the Bidder has engaged for the Work.

12.9. If the Bidder is an individual, the Bid must state the Bidder’s social security number.

12.10. If the Bidder is an entity, the Bid must describe the entity (e.g. corporation) and state the Bidder’s federal tax identification number. If the Bidder is a corporation, or if corporation is a participant in a joint venture that submits a Bid, identify the state of incorporation. If the Bidder is a limited liability company, identify the state where the Bidder was formed.
12.11. A Bid submitted by a partnership must be executed in the partnership name and signed by one or more partners or an authorized agent. A general partner must sign for a limited partnership.

12.12. A Bid submitted by a corporation must be signed by a corporate officer or an authorized agent.

12.13. A Bid submitted by a limited liability company must be signed by a member or an authorized agent.

12.14. A Bid submitted by a joint venture must be executed in the name of the joint venture, and must be signed by:

12.14.1. Each individual participating in the joint venture, and

12.14.2. For each entity participating in the joint venture, an officer or agent with authority to bind the entity.

12.15. If a Bid is signed by an agent of the Bidder, a current power of attorney authorizing the agent to bind the Bidder must be submitted with the Bid.

12.16. The person signing the Bid shall make all certifications required of the Bidder regarding compliance with ORS 279A.110, ORS 279C.800 to 279C.870, and other Applicable Laws. If the Work will be performed by a Contractor, the Contractor must make the certifications.

12.17. The Bid must detail any cost which may accrue to the SHM C as a result of Bidder’s performance of the work.

12.18. The County, the Port, and/or the SHMC shall not be liable for any costs incurred by Bidders in the preparation, submission, and presentation of its Bid.

13 **BID SECURITY:** Pursuant to ORS 279C.365(5), the Bidder shall submit to the SHMC with the Bid as Bid security a surety bond, an irrevocable letter of credit issued by an insured institution as defined in ORS 706.008, a cashier’s check, or a certified check payable to Douglas County in an amount equal to 10% of the Bid Price (without regard to Alternates). A bond must be issued by a responsible surety company licensed to do business in the State of Oregon. A bond and an irrevocable letter of credit must be valid for not less than 60 days from the date Bids are opened.
14 TIME, PLACE, AND PROCEDURE FOR SUBMITTING BIDS:

14.1 A pre-bid conference/walkthrough for contractors will be held at 1:30 PM on June 27, 2019 at the Winchester Bay RV Resort Marine Activity Center, 263 Marina Way, Winchester Bay, Oregon to discuss the Work. The pre-bid conference is mandatory. Prospective Subcontractors and Suppliers are invited and encouraged to attend, as this conference/walkthrough allows for common questions to be asked and answered by all contractors prior to bid preparation. After reviewing the Bidding Documents, prospective Bidders will examine the Work Site.

14.2 Each Bid must be submitted in a sealed envelope. The name and address of the Bidder and the following information must be typed or printed on the exterior of the envelope:

SALMON HARBOR MARINA RV RESORT EXPANSION SITE WORK

SEALED BID DO NOT OPEN

BID DUE: July 18, 2019, 2:00 PM
BID OPENING: July 18, 2019, 2:30 PM

14.3 Bids must be delivered personally, by courier, or by mail to the SHMC, 100 Ork Rock Rd; mailing address is P.O. Box 1007, Winchester, OR 97467, no later than July 18, 2019, 2:00 PM. The time of delivery will be determined by the clock at the desk of the receptionist in the Marina’s Office. A Bidder mailing a Bid should allow sufficient time for delivery by the postal service to assure timely receipt of the Bid by the SHMC. Bids received after 2:00 P.M. will not be considered. Late Bids will be returned unopened.

BIDS SUBMITTED BY FACSIMILE TRANSMISSION OR EMAIL WILL NOT BE ACCEPTED.

14.4 The SHMC will open and read Bids in a public meeting at the Marina Activity Center, 263 Marina Way, Winchester Bay, OR, which is scheduled for July 18, 2019 at 2:30 P.M.

14.5 By submitting a Bid, the Bidder certifies that:

14.5.1 The Bidder has read and understands the Bidding Documents and the terms of the proposed SHMC contract. After submitting a Bid, the Bidder cannot assert that there was any misunderstanding concerning the requirements of the Contract Documents.
14.5.2 The Bidder is familiar with the conditions that will affect the Bidder's performance, if the Bidder is selected to contract for this Project.

14.5.3 The Bid has been made independently and is being submitted without any collusion, agreement, understanding, or planned common course of action with any other Bidder.

14.5.4 The Bidder is compliant with all applicable federal, state, and local tax laws.

14.5.5 The Bidder will comply with all federal, state, and local laws, regardless of whether they are specifically identified herein, applicable to participation in this Bidding process.

14.5.6. The Bidder is an equal opportunity employer that presently complies and in the future will comply with all applicable provisions of the Civil Rights Act of 1964, as amended by the Equal Opportunity Act of 1972 (42 U.S.C. § 2000) and all regulations thereunder (e.g., 41 CFR Part 60 et seq.); Executive Orders 11246 and 11375; the Americans With Disabilities Act (42 U.S.C. §12101 et seq.); and all federal and state civil rights laws applicable to Bidder’s operations.

15 WITHDRAWAL AND AMENDMENT OF BIDS: A Bidder may withdraw or amend the Bid by submitting a written request to the Contract Administrator before Bids are opened. The request must be signed by a person who is authorized to sign a Bid under Section 12. A Bid cannot be withdrawn or amended after Bids are opened, unless there is clear evidence of a mistake by the Bidder. All Bids will be irrevocable for 30 days from the date of opening.

16 DISQUALIFICATION OF BIDDERS:

16.1. The SHMC and/or the Harbor Manager may disqualify a Bidder pursuant to ORS 279C.375(3) after conducting an investigation and considering all evidence that the SHMC deems relevant.

16.2. The SHMC and/or the Harbor Manager will disqualify any Bidder if:

16.2.1. The Bidder or the Contractor engaged by the Bidder is not registered with the Oregon Construction Contractors Board pursuant to ORS Chapter 701;
16.2.2. The Bidder or the Contractor engaged by the Bidders has been declared ineligible to bid on public contracts by the Commissioner of the Bureau of Labor and Industries under ORS 279C.860;

16.2.3. The SHMC and/or the Harbor Manager finds that the Bidder has participated in more than one Bid; or

16.2.4. The SHMC and/or the Harbor Manager finds that the Bidder has engaged in collusion among Bidders.

17  REJECTION OF BIDS:

17.1. The SHMC and/or the Harbor Manager will reject a Bid if:

17.1.1. The Bid is incomplete or the Bid Form is incorrectly completed or altered;

17.1.2. The Bid Price cannot be determined;

17.1.3. The Bid does not conform to all material Bidding Requirements or takes exceptions to the Bidding Requirements; or

17.1.4. The Bid is otherwise not responsive.

17.2. The SHMC and/or the Harbor Manager may reject any Bid that contains false information.

17.3. The SHMC reserves the right to reject any Bid for good cause and any or all Bids upon a finding by the SHMC that it is in the public interest to do so.

17.4. A Bidder will be notified in writing if the Bid is rejected when notice of the Award is given.

18  EVALUATION OF BIDS:

18.1. The SHMC and/or the Harbor Manager reserves the right to request information from any Bidder during the evaluation process as necessary to determine the Bidder’s qualifications and to resolve other issues concerning the Bid.

18.2. The SHMC and/or the Harbor Manager reserves exclusive discretion to waive defects or irregularities in a Bid that the SHMC and/or the Harbor Manager deem to be minor, and to determine the intent, purpose, and meaning of any provision of the Bidding Documents.
18.3. If the SHMC does not elect to reject all Bids, the SHMC will compare and rank all responsive Bids submitted by responsible Bidders from highest to lowest Bid Price.

18.4 Preference will be given to Goods and Services that are produced in Oregon if price, availability, fitness and quality are otherwise equal.

18.5 The SHMC and/or the Harbor Manager may correct any arithmetical errors in the Bids.

19 AWARD:

19.1. If the SHMC elects to accept a Bid, the Award will be made to the responsible Bidder who submits the lowest responsive Bid subject to the conditions stated in these Bidding Documents. The Award will be made by written order within thirty (30) after Bids are opened. The Contract Administrator and/or the Consultant will notify all Bidders.

19.2. An adversely affected or aggrieved Bidder may submit to the SHMC a written protest of the intent to award within five (5) days after issuance of the notice of intent to award the contract. Protests must be in accordance with specifications in ORS 279A.225 and ORS 279B.410.

19.3. The award of a contract is subject to revocation by, and shall not be binding upon, the SHMC unless and until a written SHMC contract incorporating all material elements of the offer upon which the award decision was based and fulfilling all applicable public contracting laws and material bidding document requirements has been fully executed by the SHMC and the contract award recipient within the time frame specified in the Bid Documents or, if the SHMC and/or the Harbor Manager determines that it is appropriate to change the specified time frame, within such time as the SHMC and/or the Harbor Manager deem to be reasonable.

20 EXECUTION OF CONTRACT:

20.1. The Contract Administrator will send a Contract in the form that is issued with these Instructions to Bidders to the successful Bidder with the notice of Award. Within ten (10) days after receiving the Contract, the Successful Bidder shall sign and return the Contract, insurance certificates, proof of workers’ compensation coverage, other documents required by the Contract Documents, including performance and payment bonds, as well as proof of public works bond filed with Construction Contractors Board.

20.2. If the Successful Bidder does not comply with Subsection 20.1, the SHMC may conclude that the Bidder has abandoned the Award.
20.3. If the SHMC determines that the Bidder initially designated as the Successful Bidder has abandoned the Award or the SHMC and/or the Harbor Manager disqualifies that Bidder, the SHMC may designate the next lowest responsive responsible bidder as the Successful Bidder. The SHMC may repeat the process described in this section until a Contract is formed.

21  EXAMINATION OF RECORDS: Any Bidder may examine public records concerning the bidding process at the Salmon Harbor Marina Office, except for records that the SHMC, through the Office of County Counsel, determines are exempt from disclosure under the Oregon Public Records Law.

22  SUPPLEMENTATION OF INSTRUCTIONS: In addition to these instructions, Bidders shall comply with the “Salmon Harbor Management Committee General Conditions for Construction Contracts” that apply to the bidding process. In the event of a conflict between these instructions and the General Conditions, these instructions shall control.

23  PUBLIC RECORDS:

23.1 This Bidding process is subject to the requirements of the Oregon Public records Law (ORS 192.311 et seq.), and the SHMC may receive public records requests for Bidders’ Bid and contract documents.

23.2 No portion(s) of any Bid is confidential, notwithstanding a Bidders’ clearly and conspicuously designating such portion(s) as confidential, proprietary, or otherwise. Such designation must include an explanation of the legal basis for exemption of the specific materials from public records disclosure requirements. Materials not clearly marked as exempt from disclosure and/or which lack the required disclosure exemption explanation will be subject to disclosure in response to public records requests.

23.3 Designation of certain Bid or contract documents as proprietary or confidential without further explanation as to why the Bidder believes them to be exempt from the Oregon Public Records Law’s disclosure requirements will not satisfy the foregoing requirements.

23.4 The SHMC will endeavor in good faith to honor appropriate requests for exemption from disclosure, but the SHMC, through the Office of County Counsel, reserves the right to make its own determination of whether Bid and contract documents designated as exempt from disclosure requirements are in fact legally exempt. The County, the Port, and/or the SHMC make no representations or assurances to Bidders that Bid and contract documents designated by Bidders as exempt will not be disclosed in response to public records requests.
23.5 By submitting a Bid, the Bidder accepts and agrees to the conditions of this Section and to hold harmless the County, the Port, and/or the SHMC, and its officers, employees, and agents for disclosure of Bid and contract documents that they deem to be required by law.
SUBSTITUTION REQUEST
(During the Bidding Phase)

Project: ____________________________ Substitution Request Number: ____________________________

_______________________________ From: ____________________________

To: ____________________________ Date: ____________________________

_______________________________ A/E Project Number: ____________________________

Re: ____________________________ Contract For: ____________________________

Specification Title: ____________________________ Description: ____________________________

Section: _________ Page: _________ Article/Paragraph: _________

Proposed Substitution:
Manufacturer: ____________________________ Address: ____________________________ Phone: ____________________________
Trade Name: ____________________________ Model No.: ____________________________

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:
• Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
• Same warranty will be furnished for proposed substitution as for specified product.
• Same maintenance service and source of replacement parts, as applicable, is available.
• Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
• Proposed substitution does not affect dimensions and functional clearances.
• Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by: ____________________________
Signed by: ____________________________
Firm: ____________________________
Address: ____________________________
Telephone: ____________________________

A/E’s REVIEW AND ACTION

☐ Substitution approved - Make submittals in accordance with Specification Section 01330.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01330.
☐ Substitution rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: ____________________________ Date: ____________________________

Supporting Data Attached:  ☐ Drawings  ☐ Product Data  ☐ Samples  ☐ Tests  ☐ Reports
BID FORM

Salmon Harbor Marina RV Expansion

SITE WORK

HGE Project No. 15.68

TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Article</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARTICLE 1</td>
<td>Bid Recipient</td>
<td>1</td>
</tr>
<tr>
<td>ARTICLE 2</td>
<td>Bidder’s Acknowledgements</td>
<td>1</td>
</tr>
<tr>
<td>ARTICLE 3</td>
<td>Bidder’s Representations</td>
<td>1</td>
</tr>
<tr>
<td>ARTICLE 4</td>
<td>Bidder’s Certification</td>
<td>2</td>
</tr>
<tr>
<td>ARTICLE 5</td>
<td>Basis of Bid</td>
<td>3</td>
</tr>
<tr>
<td>ARTICLE 6</td>
<td>Time of Completion</td>
<td>4</td>
</tr>
<tr>
<td>ARTICLE 7</td>
<td>Attachments to this Bid</td>
<td>4</td>
</tr>
<tr>
<td>ARTICLE 8</td>
<td>Defined Terms</td>
<td>5</td>
</tr>
<tr>
<td>ARTICLE 9</td>
<td>Bid Submittal</td>
<td>6</td>
</tr>
</tbody>
</table>
ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:

Salmon Harbor Marina
Attn: Paul Stallard, Harbor Manager
100 Ork Rock Road / PO Box 1007
Winchester Bay, Oregon 97467

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – BIDDER’S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 30 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 – BIDDER’S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

<table>
<thead>
<tr>
<th>Addendum No.</th>
<th>Addendum Date</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Project: SALMON HARBOR RV RESORT EXPANSION - SITE WORK; HGE Project Number: 15.68
Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.

E. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder’s safety precautions and programs.

F. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.

G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and confirms that the written resolution thereof by Engineer is acceptable to Bidder.

I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.

J. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 4 – BIDDER’S CERTIFICATION

4.01 Bidder certifies that:

A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;

B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;

C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and

D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:

   1. “corrupt practice” means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process;

   2. “fraudulent practice” means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and

4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

5. Bidder certifies that Bidder will comply with ORS 279C.840 regarding prevailing wage rates.

6. Bidder ☐ is ☐ is not a resident bidder as defined in ORS 279A.120.

ARTICLE 5 – BASIS OF BID

BASE BID

5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

(See table on following page)

Bidder acknowledges that (1) each Bid Unit and Lump Sum Price includes an amount considered by Bidder to be adequate to cover Contractor’s overhead and profit for each separately identified item, and (2) estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all unit price Bid items will be based on actual quantities, determined as provided in the Contract Documents.
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description/ Specification</th>
<th>Unit</th>
<th>Estimated Quantity</th>
<th>Bid Unit Price</th>
<th>Bid Price</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Mobilization / 0--5050</td>
<td>L.S.</td>
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<tr>
<td>2</td>
<td>Temporary Traffic Control / 01-5500, 01-5600</td>
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<td>3</td>
<td>Construction Facilities &amp; Temporary Controls (includes compaction testing) / 01-4523, 01-5000, 01-5100, 01-5110, 01-5200, 01-5500, 01-5600</td>
<td>L.S.</td>
<td>1</td>
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<td>4</td>
<td>Demolition &amp; Site Preparation / 01-7200, 31-1000, 02-4100</td>
<td>L.S.</td>
<td>1</td>
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<td>5</td>
<td>Erosion &amp; Sediment Control / 01-5713</td>
<td>L.S.</td>
<td>1</td>
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<td>6</td>
<td>Site Clearing /31-1000</td>
<td>L.S.</td>
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<tr>
<td>7</td>
<td>Grading / 31-2200, 31-2316</td>
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<tr>
<td>8</td>
<td>Import Fill / 31-2323</td>
<td>C.Y.</td>
<td>500</td>
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<tr>
<td>9</td>
<td>Foundation Stabilization / 31-2316.13</td>
<td>C.Y.</td>
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<td>10</td>
<td>Subgrade Geotextile Fabric / 31-2323</td>
<td>S.Y.</td>
<td>4240</td>
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<tr>
<td>11</td>
<td>1&quot;-0&quot; Aggregate Base Course in Place / 32-1123</td>
<td>Ton</td>
<td>4662</td>
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<tr>
<td>12</td>
<td>Asphalt Paving, 3&quot; thick / 32-1216</td>
<td>Ton</td>
<td>2572</td>
<td></td>
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</tr>
<tr>
<td>13</td>
<td>8&quot; PVC sanitary sewer piping, excavation, bedding, pipe zone, Class A backfill, complete / 33-3113</td>
<td>L.F.</td>
<td>1610</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>6&quot; PVC sanitary sewer piping, excavation, bedding, pipe zone, Class A backfill, complete / 33-3113</td>
<td>L.F.</td>
<td>265</td>
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<tr>
<td>15</td>
<td>4&quot; PVC sanitary sewer piping, excavation, bedding, pipe zone, Class A backfill, complete / 33-3113</td>
<td>L.F.</td>
<td>1600</td>
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</tr>
<tr>
<td>16</td>
<td>8&quot; connection to existing sanitary sewer manhole including core drill, watertight adapter boot, grout, channel finishing, complete / 33-0513</td>
<td>EA</td>
<td>1</td>
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</tr>
<tr>
<td>Item</td>
<td>Description</td>
<td>Unit</td>
<td>Quantity</td>
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</tr>
<tr>
<td>17</td>
<td>Standard 48&quot; Sewer Manhole over 8' deep / 33-0513</td>
<td>EA</td>
<td>2</td>
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<td>18</td>
<td>Standard 48&quot; Sewer Manhole under 8' deep / 33-0513</td>
<td>EA</td>
<td>4</td>
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<td>19</td>
<td>6&quot; Sewer Service Cleanout / 33-0513</td>
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<td>3</td>
<td></td>
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<td>20</td>
<td>4&quot; Sewer Service Cleanout / 33-0513</td>
<td>EA</td>
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<td>21</td>
<td>4&quot; PVC waterline piping, excavation, bedding, pipe zone, Class A backfill, complete / 33-1200</td>
<td>L.F.</td>
<td>660</td>
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<tr>
<td>22</td>
<td>3&quot; PVC waterline piping, excavation, bedding, pipe zone, Class A backfill, complete / 33-1200</td>
<td>L.F.</td>
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<tr>
<td>23</td>
<td>2&quot; PVC waterline piping, excavation, bedding, pipe zone, Class A backfill, complete / 33-1200</td>
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<td>1&quot; PVC waterline piping, excavation, bedding, pipe zone, Class A backfill, complete / 33-1200</td>
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<tr>
<td>25</td>
<td>3/4&quot; PVC waterline piping, excavation, bedding, pipe zone, Class A backfill, complete / 33-1200</td>
<td>L.F.</td>
<td>200</td>
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<td>26</td>
<td>8&quot; x 4&quot; Tee / 33-1200</td>
<td>EA</td>
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<td>27</td>
<td>4&quot; Gate Valve / 33-1200</td>
<td>EA</td>
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<td>2&quot; Gate Valve / 33-1200</td>
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<td>4&quot; Reduced Pressure Backflow Device / 33-1200</td>
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<td>30</td>
<td>2&quot; Reduced Pressure Backflow Device / 33-1200 for landscape</td>
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<td>31</td>
<td>12&quot; HDPE storm drain piping, excavation, bedding, pipe zone, Class A backfill, complete / 33-4113</td>
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<td>32</td>
<td>Storm Drain Structures / 33-4400</td>
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<tr>
<td>33</td>
<td>Landscape Irrigation / 32-8423</td>
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<td>34</td>
<td>Vegetated Drainage Swale / 32-9200</td>
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<td>3845</td>
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<td>35</td>
<td>Seeding / 32-9200</td>
<td>S.F.</td>
<td>86,670</td>
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### ALTERNATE BID #1 - Grade and Landscaping on Existing Slope (ADD to Base Bid):

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description/ Specification</th>
<th>Unit</th>
<th>Estimated Quantity</th>
<th>Bid Unit Price</th>
<th>Bid Price</th>
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<td>43</td>
<td>Clear Grub, Grade Smooth</td>
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<td>44</td>
<td>Slope Stabilization Seeding Mix / 32-9200</td>
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<tr>
<td>45</td>
<td>Planting / 32-9300</td>
<td>L.S.</td>
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</tbody>
</table>

**Total Base Bid (number): $**

**Total Base Bid (words):**

Dollars, and Cents

**Total Alternate Bid #1 (number): $**

**Total Alternate Bid #1 (words):**

Dollars, and Cents

---

**ARTICLE 6 – TIME OF COMPLETION**
ARTICLE 6 – TIME OF COMPLETION

6.01  Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.

6.02  Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 – ATTACHMENTS TO THIS BID

7.01  The following documents are submitted with and made a condition of this Bid:

A.  Required Bid security with notarized copy of Power of Attorney for Attorney-in-Fact who executes a Bid Bond on behalf of Surety.

B.  First-Tier Subcontractor Disclosure Form within 2 hours of bid closing time;

C.  Evidence of authority to do business in the state of Oregon; or a written covenant to obtain such license within the time for acceptance of Bids;

D.  Contractor’s License No.: [or] Evidence of Bidder’s ability to obtain a State Contractor’s License and a covenant by Bidder to obtain said license within the time for acceptance of Bids;

ARTICLE 8 – DEFINED TERMS

8.01  The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions for Construction Contracts.

ARTICLE 9 – BID SUBMITTAL

BIDDER: [Indicate correct name of bidding entity]

________________________________________________________________________

By:
[Signature]

[Printed name]

(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest:
[Signature]

[Printed name]

Title: ________________________________
Submittal Date: 

Address for giving notices:

Telephone Number: 
Fax Number: 
Contact Name and e-mail address: 

Bidder’s License No.: 

(where applicable)
We, ________________________________________, as “Principal,”

(Name of Principal)

and______________________________________, an_________________Corporation,

(Name of Surety)

authorized to transact Surety business in Oregon, as “Surety,” hereby jointly and severally bind
ourselves, our respective heirs, executors, administrators, successors and assigns to pay unto
Salmon Harbor Management Committee (“Obligee”) the sum of ($) __________________________

___________________________________________ dollars.

WHEREAS, the condition of the obligation of this bond is that Principal has submitted its proposal or
bid to an agency of the Obligee in response to Obligee’s procurement document (No. ____________) for the
project identified as:

__________________________________________ which proposal

or bid is made a part of this bond by reference, and Principal is required to furnish bid security in an
amount equal to ten (10%) percent of the total amount of the bid pursuant to the procurement
document and ORS 279C.365(4) for competitive bidding or 279C.400(5) for competitive proposals.

NOW, THEREFORE, if the proposal or bid submitted by Principal is accepted, and if a contract
pursuant to the proposal or bid is awarded to Principal, and if Principal enters into and executes such
contract within the time specified in the procurement document and executes and delivers to Obligee
its good and sufficient performance and payment bonds required by Obligee, as well as any required
proof of insurance, within the time fixed by Obligee, then this obligation shall be void; otherwise, it
shall remain in full force and effect.

IN WITNESS WHEREOF, we have caused this instrument to be executed and sealed by our duly
authorized legal representatives this _______________ day of ________________,
20__ .

PRINCIPAL: ____________________________  SURETY: ____________________________
By____________________________________  BY ATTORNEY-IN-FACT

____________________________________
Signature

____________________________________
Official Capacity

Attest:_________________________________
Corporation Secretary

____________________________________
Signature

____________________________________
Address

City State Zip

Phone Fax

____________________________________

Salmon Harbor Marina – RV Expansion Site Work #15.68
May 2019
FIRST-TIER SUBCONTRACTOR DISCLOSURE FORM

PROJECT NAME: SALMON HARBOR MANAGEMENT COMMITTEE
SALMON HARBOR MARINA RV EXPANSION - SITE WORK

This form must be submitted at the location specified in the Invitation to Bid on the advertised closing date and within two working hours after the advertised closing time.

List below the name of each subcontractor that will be furnishing labor or will be furnishing labor and materials in connection with this public improvement; and that will have a contract value that is equal to or greater than five percent (5%) of the total project bid or $15,000.00, whichever is greater, or $350,000.00 regardless of the percentage of the total project bid. The disclosure of the first-tier subcontractors shall include the name of each subcontractor, the category of work that subcontractor will be performing and the dollar value of the subcontract. Enter “NONE” if there are no subcontractors that need to be disclosed. (Attach additional sheets if needed).

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<tr>
<th>SUBCONTRACTOR NAME</th>
<th>CATEGORY OF WORK</th>
<th>DOLLAR VALUE</th>
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Failure to submit this form by the disclosure deadline will result in a nonresponsive bid. A
nonresponsive bid will not be considered for award.

Form submitted by (bidder name)______________________________

Contact name:_________________________ Phone No.:__________________
CONTRACT AGREEMENT BETWEEN DOUGLAS COUNTY AND PORT OF UMPQUA, ACTING BY AND THROUGH THE SALMON HARBOR MANAGEMENT COMMITTEE
SALMON HARBOR MARINA RV RESORT EXPANSION
SITE WORK

This agreement #__________ is made on______________________, between Douglas County (“County”) and Port of Umpqua (“Port”), acting by and through the Salmon Harbor Management Committee (“SHMC”), and ____________________________ (“Contractor”).

CONTRACTOR AND COUNTY AGREE:

1. This agreement is executed pursuant to Bidding Documents issued by the County, acting by and through the SHMC, for the SALMON HARBOR MARINA RV RESORT EXPANSION SITE WORK, WINCHESTER BAY, OR (“the Work”). Contractor submitted a Bid for the Work which has been accepted by the SHMC. The Contract Documents described below supersede the Bidding Documents.

   1. The following Contract Documents are incorporated in this Agreement:

      - Contractor’s Bid dated______________, in the amount of $_______________.
      - Supplemental Contract Terms
      - Payment of Prevailing Wage Sheet
      - Addenda numbered as follows:

          No.____

          No.____

          No.____

          No.____

          No.____

      - Project Plans, Specifications, and Drawings (issued with the Bidding Documents)
      - All documents contained in the Project Manual (which will be kept on file in Management and Finance and will not be filed with this contract in the Clerk’s Office).
2. Contractor shall perform the entire Work, and SHMC will pay Contractor the Contract Price in accordance with the Contract Documents.

<table>
<thead>
<tr>
<th>Contractor</th>
<th>Salmon Harbor Management Committee</th>
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<td>Salmon Harbor Manager</td>
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<tr>
<td>Office of County Counsel</td>
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<tr>
<td>Date:</td>
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</table>
SUPPLEMENTAL CONTRACT TERMS

SALMON HARBOR MARINA RV RESORT EXPANSION
SITE WORK

The parties agree to the following Supplemental Contract Terms:

1. CONTRACTOR’S RESPONSIBILITY FOR THE WORK: By executing this Contract, the Contractor acknowledges that the Contractor:

   • Has carefully examined the Contract Documents, other pertinent Documents, and all available information concerning physical conditions at the Work Site;
   • Has determined that labor, construction equipment, and Materials that are needed for the Work are available;
   • Has notified the Contract Administrator of errors, ambiguities, or inconsistencies in the Contract Documents; and
   • Is not relying on representations by any officer, employee, or agent of the County about the Work that are not included in or made pursuant to the Contract Documents.

2. USE OF PREMISES:

   2.1 The SHMC will allow the Contractor to have access to the Work site and use of the Work site as necessary for performance of the Work. The Contractor shall confine the Work to the Work Site and areas that the Contractor is allowed to use for access to the Work Site as described in this Contract.

   2.2 The Contractor shall accommodate regular use of the Premises and provide any temporary facilities necessary for safe use of the Premises. The Contractor shall not unreasonably obstruct use of the Premises or allow debris from the Work to accumulate. Upon completion of the Work, the Contractor shall remove from the Premises all debris resulting from the Work and the contractor’s personal property and leave the Premises clean and ready for use by the Agency.

3. CONTRACT TIME: Construction shall commence August 19, 2019 and be completed by March 8, 2020. Once installation has begun, the Contractor must maintain continuous work to ensure the Project is completed prior to March 8, 2020.

4. PAYMENT OF PREVAILING WAGE RATES: Section 30 of the SHMC General Conditions for Construction Contracts is modified to indicate that this Contract is subject to the 2019 Prevailing Wage Rates.
5. LIABILITY OF COUNTY’S OFFICERS, EMPLOYEES, AND AGENTS: Officers, employees, and agents of the County will not have any personal liability to the Contractor or the successors, principals, Subcontractors, Suppliers, insurers, or sureties of the Contractor for actions taken within the scope of their authority under the Contract Documents.

6. NO AGENCY: The Contractor, Subcontractors, Suppliers, and their principals, officers, employees and agents are not agents of the County as that term is used in ORS 30.265.

7. ADMINISTRATION OF CONTRACT: Paul Stallard, Harbor Manager, is Contract Administrator for this Project.

8. NOTICES:

   8.1 Notices to the County will be directed to the Contract Administrator. SHMC’s address for notices is 100 Ork Rock Road, with mailing address at P.O. Box 1007, Winchester Bay, Oregon 97467.

   8.2 Notices to the Contractor will be delivered to the Contractor’s superintendent at the Work Site or mailed or delivered to the Contractor at the following address:______________________________.
ORS 279C.505 (2) provides that every public improvement contract contains a condition that the Contractor shall demonstrate that an employee drug testing program is in place. The County’s award of the Contract for which this certificate is required is conditioned, in part, upon the Bidder’s demonstration of compliance with the provisions of ORS 279C.505(2). If the Bidder named above is awarded the Contract, this certificate shall become a part of, and shall constitute a continuing representation and warranty under, the Contract.

To induce the SHMC to award the Contract to the Bidder, the undersigned, as the duly authorized representative of the Bidder, hereby represents and warrants, on behalf of the above named Bidder:

1. That Bidder has and enforces, and at all times during the term of the Contract will have and enforce, a written employee drug testing policy that at a minimum, requires compliance with the Oregon Department of Transportation Commercial Drivers License drug testing regulations;

2. A copy of the Bidder’s current written employee drug testing policy will be available for inspection by the SHMC at any time upon the SHMC’s request; and

3. The Bidder understands and agrees that its representations and warranties herein will become a continuing part of the Contract and that breach of any of the foregoing will be sufficient grounds for disqualification under 279C.440(2)(d).

The SHMC shall not be liable, either directly or indirectly, in any dispute arising out of the substance or procedure of Bidder/Contractor’s drug testing program. Nothing in this drug testing provision shall be construed as requiring Bidder/Contractor to violate any legal, including constitutional, rights of any employee, including but not limited to, selection of which employees to test and the manner of such testing. The SHMC shall not be liable for Bidder/Contractor’s negligence in establishing or implementing, or failure to establish or implement, a drug testing policy, or for any damage or injury caused by
Bidder/Contractor’s employees acting under the influence of drugs while performing work covered by the Contract. These are Bidder/Contractor’s sole responsibilities.

In Witness whereof, the Bidder has caused this document to be executed by its duly authorized representative on the date shown below.

Signature:

Printed Name, Title:

Date:
PERFORMANCE BOND

The undersigned __________________________________________, as principal, hereinafter called Contractor, and __________________________________________, as surety, hereinafter called Surety, are held and firmly bound unto SHMC, as obligee, in the sum of __________________________________________ Dollars ($___________________________).

Contractor and County have entered into a written contract, hereinafter called the Contract, dated ________________, for the following project: SALMON HARBOR MARINA RV EXPANSION – SITE WORK

The Contract Documents, as defined in the above referenced contract, are incorporated herein by reference.

The conditions of this bond are:

1. If Contractor faithfully performs the Contract within the time prescribed by the Contract, then this obligation is null and void; otherwise it shall remain in full force and effect.

2. If Contractor is declared by SHMC to be in default under the Contract, the Surety shall promptly remedy the default, perform all of Contractor's obligations under the Contract in accordance with its terms and conditions and pay to County all damages that are due under the Contract.

3. This obligation jointly and severally binds Contractor and Surety and their respective heirs, executors, administrators, successors.

4. Surety hereby waives notice of modification of the Contract or extension of the Contract time.

5. Nonpayment of the bond premium shall not invalidate this bond.

6. The bond number and the name, address and telephone number of the agent authorized to receive notices concerning this bond are as follows:

   Bond Number__________________________________________
Salmon Harbor Marina – RV Expansion Site Work #15.68
May 2019

Performance Bond
Page 2

Bond Agent

Address

Telephone

SIGNED this day of ,

WITNESS: Contractor

(Corporate Seal) By

Title

Legal Address

Attest: Corporate Secretary

WITNESS: Surety

(Corporate Seal) By

Title

Legal Address

Attest: Corporate Secretary
PAYMENT BOND

The undersigned ________________________________, as principal, hereinafter called Contractor, and ________________________________, as surety, hereinafter called Surety, are held and firmly bound unto SHMC, as obligee, in the sum of ________________________________ Dollars ($ ________________________________).

Contractor and SHMC have entered into a written contract, hereinafter called the Contract dated ________________, for the following project: SALMON HARBOR MARINA RV EXPANSION – SITE WORK

The Contract Documents, as defined in the above referenced contract, are incorporated herein by reference.

The conditions of this bond are:

1. If Contractor faithfully performs the Contract within the time prescribed by the Contract, and promptly makes payment to all claimants, as defined herein, then this obligation is null and void; otherwise it shall remain in full force and effect.

2. If Contractor is declared by SHMC to be in default under the Contract, the Surety shall promptly remedy the default, perform all of Contractor's obligations under the Contract in accordance with its terms and conditions and pay to County all damages that are due under the Contract.

3. This bond is subject to claims under ORS 279C.600 through 279C.625.

4. This obligation jointly and severally binds Contractor and Surety and their respective heirs, executors, administrators, successors.

5. Surety hereby waives notice of modification of the Contract or extension of the Contract time.

6. Nonpayment of the bond premium shall not invalidate this bond.

7. The bond number and the name, address and telephone number of the agent authorized to receive notices concerning this bond are as follows:

Bond Number ________________________________
Bond Agent

Address

Telephone

SIGNED this _____ day of ____________

WITNESS: Contractor________________________

(Corporate Seal) By

Title_____________________________________

Legal Address______________________________

Attest:____________________________________

Corporate Secretary

WITNESS: Surety___________________________

(Corporate Seal) By

Title_____________________________________

Legal Address______________________________

Attest:____________________________________

Corporate Secretary
PAYMENT OF PREVAILING WAGE RATES:

The Contractor shall comply fully with the provisions of ORS 279C.840 to 279C.870 for payment of prevailing wage rates on public works contracts. This requirement to pay not less than the prevailing wage rate shall apply to all workers employed on the project by Contractor, any and all subcontractors employed by Contractor, or other persons doing or contracting to do the whole or any part of the Work required for this project.

Contractor shall incorporate this provision in all subcontracts for the work covered by this Contract.

The existing prevailing rates of wages as established by the Commissioner of the Bureau of Labor and Industries are available from the Oregon Bureau of Labor and Industries and are incorporated into this Contract.

Contractor and any subcontractor engaged in the work shall keep the prevailing wage rates for the work posted in a conspicuous and accessible place in or about the project. The contractor may obtain copies of applicable schedules of prevailing rates from the Bureau of Labor and Industries.

Contractor shall file a Public Works Bond with the Construction Contractor’s Board before commencing Work under this contract and shall maintain said bond throughout performance of Work under this contract unless exempt from doing so pursuant to ORS 279C.836.

Prevailing wage rates applicable to this project may be viewed and downloaded at the following site:

SALMON HARBOR MANAGEMENT COMMITTEE
GENERAL CONDITIONS FOR CONSTRUCTION CONTRACTS

1 DEFINITIONS AND INTERPRETATION

1.1 Unless particular provisions of the Contract Documents state otherwise, the following definitions apply to all Contract Documents:

1.1.1 “Addendum” or “Addenda” means a document or documents issued by Salmon Harbor Management Committee before Bids are due that change the Bidding Documents.

1.1.2 “Agreement” means the Contract Document signed by the Parties that incorporates all other Contract Documents by reference.

1.1.3 “Alternate” means a variation in the scope of the Work that is identified as an Alternate in the Bid Schedule and that is either included in or excluded from the Contract Documents by the Agreement.

1.1.4 “Amendment” means a Contract Document executed by Salmon Harbor Management Committee and the Contractor that changes nontechnical provisions of the Contract Document.

1.1.5 “Applicable Laws” means all codes, statutes, regulations, rules, orders, ordinances, and other legal requirements of Governmental Agencies that affect the Work or the Contract Documents.

1.1.6 “Application for Payment” means the completed form and supporting documents that the Contractor must submit to obtain payment.

1.1.7 “As-built Documents” means a version of the Plans and Specifications that is updated as construction proceeds to show changes in the components, constituents, dimensions, and details of the Work as constructed.

1.1.8 “Award” means Salmon Harbor Management Committee’s formal decision accepting a Bid which is made by written order.

1.1.9 “Base Bid” means the amount stated in the Bid Schedule for the basic scope of the Work which may be increased or decreased by Alternates.

1.1.10 “Bid” means the written offer to perform the Work, including all supporting documentation submitted by the Contractor to Salmon Harbor Management Committee.

1.1.11 “Bid Schedule” means that part of the Bid that lists Pay Items, units of measurement, prices, estimated quantities, and the total Bid price. The Base Bid and any Alternates that are added to or deleted from the Base Bid by the Agreement will become the “Contract Price Schedule”.

1.1.12 “Bidding Documents” means all documents issued by Salmon Harbor Management Committee to solicit Bids, including prospective Contract Documents.
1.1.13 “Change in the Work” means a change in the Specifications, Plans, Progress Schedule, and other requirements for the Work which is authorized under the Contract Documents.
1.1.14 “Change Order” means a Contract Document executed by SHMC and the Contractor that authorizes a Change in the Work.
1.1.15 “Claim”, unless modified by “Third-Party”, means a dispute between the Parties concerning this Contract or the Work.
1.1.16 “Construction Method” means any construction means, method, technique, sequence, procedure, or equipment that is used to perform the Work.
1.1.17 “Consultant” means an architect, engineer, or other consultant with professional or technical expertise in a field related to the Work who is engaged by SHMC as an independent contractor to assist the Contract Administrator in administration of the Project.
1.1.18 “Contract Administrator” means the representative of SHMC who is authorized by SHMC to administer the Contract and the Project on behalf of SHMC.
1.1.19 “Contract Documents” means the documents that govern the contractual rights and obligations of the Parties concerning the Work, including these General Conditions, Supplementary Conditions, Specifications, Plans, Drawings, the Contract Price Schedule, the Schedule of Values, the Notice to Proceed, Amendments, change Orders, Work Change Directives, Field Orders, and the Punch List.
1.1.20 “Contract Price” means the total amount payable to the Contractor for the Work as determined by the Contract Documents.
1.1.21 “Contract Time” means the time during which the Contractor must complete the Work as stated in the Contract Documents.
1.1.22 “Contractor” means the person or entity who enters into the Contract with SHMC to perform the Work as the prime contractor.
1.1.23 “County” means Douglas County, Oregon
1.1.24 “County Counsel” means an attorney in the Office of the County Counsel established by Douglas County Code Chapter 2.08.
1.1.25 “Document” means any book, paper, photograph, drawing, model, video or sound recording, electronic record, or other material or record which contains verbal, numerical, or graphic information.
1.1.26 “Environmental Laws” means Applicable Laws pertaining to Hazardous Substances, environmental health hazards, environmental pollution, industrial hygiene, or preservation of natural resources.
1.1.27 “Equipment”, unless preceded by the word “construction” means machinery, equipment, hardware, and other mechanisms that are furnished by the Contractor as components or constituents of the Work.
1.1.28 “Field Order” means a written order which is issued by the Contract Administrator to make a minor Change in the Work.
1.1.29 “Goods” has the meaning stated in ORS 72.1050.
1.1.30 “Governmental Agency” means any federal, state, or local governmental entity, agency, or officer with jurisdiction over any aspect of the Work.

1.1.31 “Hazardous Substance” means any hazardous, toxic, infectious, or radioactive substance which is regulated by an Environmental Law and which may pose a hazard to human health or the environment, including “Hazardous Chemicals” that are described in Subsection 31.5 and “hazardous Substances” as defined in ORS 465.200.

1.1.32 “Improvement” means any structure attached to real property.

1.1.33 “Incidental Work” means a part of the Work that must be provided to fulfill the intent of the Contract Documents or that is customarily provided in conjunction with a Pay Item, but is not listed as a Pay Item.

1.1.34 “Inspector” means a representative of SHMC who is authorized to inspect the Work and report on the Contractor’s performance.

1.1.35 “Lump Sum” and the abbreviation “L.S.” mean an undivided fixed price for a Pay Item that is not measured by units.

1.1.36 “Marina” means Salmon Harbor Marina.

1.1.37 “Materials” means natural and artificial substances and things that are provided by the Contractor as components, constituents, or elements of the Work, including Equipment.

1.1.38 “Notice to Proceed” means the official written notice from the Contract Administrator to the Contractor that authorizes the Contractor to begin the Work.

1.1.39 “Overhead” means general administrative expenses of operating the Contractor’s business, including compensation for supervisory employees who are not regularly involved in the Work at the Work site, general office expenses, interest and other capital expense, and taxes.

1.1.40 “Party” or “Parties” means SHMC or the Contractor or both.

1.1.41 “Pay Item” means a part of the Work for which a specific Unit Price or Lump Sum is stated in the Contract Price Schedule.

1.1.42 “Plans” means Contract Documents prepared by SHMC or a Consultant which illustrate or delineate the design, location, dimensions, and details of the Work in pictorial or graphic form.

1.1.43 “Port” means Port of Umpqua.

1.1.44 “Premises” means land and Improvements that are owned or occupied by SHMC that contain the Work Site and areas that may be used by Contractor for access to the Work Site.

1.1.45 “Product Data” means illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other documents provided by the Contractor that contain information on Materials.

1.1.46 “Progress Payments” means monthly payments that SHMC is required to make as the Work progresses pursuant to ORS 279C.570(2).

1.1.47 “Progress Schedule” means the schedule approved by the County that identifies and assigns durations to activities that must be completed in
order to complete the entire Work within the Contract Time and which is used to measure the Contractor’s performance.

1.1.48 “Project” means a project for a public work, as defined in ORS 279C.800(6)(a), which includes the Work covered by this Contract and may include other work that is performed by SHMC or other prime contractors.

1.1.49 “Proprietary Product” means a Material which is described in the Specifications by brand name or which is held under patent or trademark by a particular person or entity.

1.1.50 “Punch List” means a list of tasks yet to be completed or deficiencies in the Work which must be corrected before final payment.

1.1.51 “Resort” means Winchester Bay RV Resort.

1.1.52 “Samples” means physical examples of Materials or workmanship submitted by the Contractor which illustrate some part of the Work and which will establish standards by which that part of the Work will be judged.

1.1.53 “Schedule of Values” means a written basis for making Progress Payments for Lump Sums that are stated in the Contract Price Schedule.

1.1.54 “SHMC” means Salmon Harbor Management Committee.

1.1.55 “Shop Drawings” means drawings, diagrams, and other documents in graphic or pictorial form which are prepared by the Contractor, a Subcontractor, or a Supplier to depict or delineate details of the Work.

1.1.56 “Sole Source Product” means a Material that comes from a particular source, is supplied by a particular vendor, or is made by a particular manufacturer.

1.1.57 “Specifications” means the written verbal or numerical standards and technical descriptions of the Work that are issued by the Owner as part of the original Contract Documents or are incorporated in a Change Order or Work Change Directive.

1.1.58 “Specified Product” means a Sole Source Product, Proprietary Product, or generic Materials with specific features, components, constituents, elements, or qualities that are described in the Specifications at the time the Agreement is signed.

1.1.59 “Subcontractor” means a person or entity who has a “Subcontract” with the Contractor or with another Subcontractor at any tier for performing part of the Work, other than merely supplying Materials.

1.1.60 “Submittals” means Shop Drawings, Product Data, Samples, and other documents or items that the Contract Documents require the Contractor to submit to the Contract Administrator for approval.

1.1.61 “Substantial Completion” means the point at which the Work (or apart of it, if specified by the Contract Documents) is sufficiently complete that SHMC may occupy and fully use it for its intended purpose without interference by the Contractor.

1.1.62 “Substitute” means a product that the Contractor proposes to use for the Work instead of a Specified Product.
1.1.63 “Supplementary Conditions” means a Contract Document that supplements or modifies these General Conditions.

1.1.64 “Supplier” means a person or entity who provides Materials or other Goods to the Contractor or a Subcontractor for the Work, but does not perform Work at the Work Site.

1.1.65 “Third-Party Claims” means demands, claims, actions, arbitrations, and other adversarial proceedings that are asserted, filed, prosecuted, or appealed against a Party by a person or entity other than a Party and all resulting expenses and liabilities, including damages, penalties, judgments, attorney fees, mediation costs, arbitration costs, and litigation costs.

1.1.66 “Unit Price” means the price for a Pay Item that will vary in quantity. A Pay Item with a Unit Price is referred to as “Unit Price Work”.

1.1.67 “Utilities” means pipelines, conduits, ducts, cables, wires, and other facilities for producing, transmitting, or distributing power, communications, heat, gas, oil, water, wastewater, storm water, or other utility services or products.

1.1.68 “Work” means both the process and the result of the Contractor performing personal services and labor and furnishing Materials and other Goods, tools, construction equipment, utilities, transportation, fuel, facilities, and documents that are required by the Contract Documents for construction, reconstruction, major renovation, or painting of Improvements that constitute all or part of the Project.

1.1.69 “Work Change Directive” means a Contract Document issued unilaterally by SHMC directing a Change in the Work which may affect the Contract Price or the Contract Time.

1.1.70 “Work Site” means the area where the Work will be performed as designated in the Contract Documents.

1.1.71 “Working Day” means Monday through Friday excluding holidays.

1.2 Generally, unless particular provisions of the Contract Documents state otherwise or unless the context indicates otherwise, the following provisions apply to interpretation of the Contract Documents:

1.2.1 Words defined in the Contract Documents and references to specific sections and subsections will be capitalized.

1.2.2 Words in the present tense include the future and vice versa.

1.2.3 Words and phrases used as nouns include the singular and plural forms.

1.2.4 Words and phrases that are not defined in the Contract Documents will have the definition stated in Applicable Law, and if there is no definition in Applicable Law, the meaning commonly accepted in the construction industry.
1.2.5 “Shall”, “will”, and “must” signify acts or obligations that are mandatory. “Should” signifies an act that is preferred, but not required. “May” signifies a discretionary or permissive act.

1.2.6 The phrase “without limitation” will be deemed to follow the words “include”, “includes”, and “including” when referring to a list, class, or group of persons, entities, things, conditions, acts, omissions, events, obligations, rights, remedies, or liabilities.

1.2.7 “As shown”, “as indicated”, and similar phrases in the Specifications mean as shown or indicated on the Plans.

1.2.8 “As directed”, “as determined”, “as prescribed”, “as authorized”, “as approved”, and similar phrases refer to directives or decisions of the Contract Administrator.

1.2.9 If a sentence uses the imperative mood, “the Contractor” will be inferred as the subject, and the auxiliary verb “shall” will be inferred with respect to the action described.

1.2.10 Modifying words such as “all” and “any” and articles such as “the” and “an”, may be omitted, but including or omitting an article or modifier should not affect the interpretation of a provision of the Contract Documents.

1.2.11 References to sections or subsections that do not expressly identify a specific Contract Document will mean the sections and the subsections of the Contract Document in which the references are made.

1.2.12 References to codes, manuals, standard specifications, or other publications of any Governmental Agency, technical organization, or professional organization mean the latest version in effect in Douglas County, Oregon on the date that the Bidding Documents are issued.
2. **ABBREVIATIONS** The following abbreviations may be used in the Contract Documents for Applicable Laws, specifications, manuals, published standards, Governmental Agencies, technical organizations, and professional organizations:

- AAMA: Architectural Aluminum Manufacturers Association
- AAN: American Association of Nurserymen
- AASHTO: American Association of State Highway and Transportation Officials
- ABC: Associated Builders and Contractors, Inc.
- ACI: American Concrete Institute
- ACPA: American Concrete Pipe Association
- ACEC: American Consulting Engineers Council
- AGC: Associated General Contractors of America
- AIA: American Institute of Architects
- AISC: American Institute of Steel Construction
- AISI: American Iron and Steel Institute
- AITC: American Institute of Timber Construction
- ANSI: American National Standards Institute
- APA: American Plywood Association
- APWA: American Public Works Association
- ASCE: American Society of Civil Engineers
- ASHERAE: American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc.
- ASME: American Society of Mechanical Engineers
- ASTM: American Society for Testing and Materials
- AWG: American Wire Gauge
- AWPA: American Wood Preservers Association
- AWS: American Welding Society
- AWWA: American Water Works Association
- CBM: Certified Ballast Manufacturers
- CFR: Code of Federal Regulations
- CISCA: Ceiling and Interior Systems Contractors Association
- CRSI: Concrete Reinforcing Steel Institute
- CS: Commercial Standard, Commodity Standards Division, US Dept of Commerce
- CSI: Construction Specifications Institute
- D1.1: AWS Structural Welding Code – Steel
- DEQ: Oregon Department of Environmental Quality
- DOGAMI: Oregon Department of Geology and Mineral Industries
- DSL: Oregon Division of State Lands
- EJCDC: Engineers Joint Contract Documents Committee
- EPA: US Environmental Protection Agency
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<td>FGMA</td>
<td>Flat Glass Marketing Association</td>
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<td>FM</td>
<td>Factory Mutual Engineering Corporation</td>
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<td>FHWA</td>
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<td>GSA</td>
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<td>IBC</td>
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<td>ICC</td>
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<td>International Conference of Building Officials</td>
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<td>ICEA</td>
<td>Insulated Cable Engineers Association</td>
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<td>IES</td>
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<td>National Electrical Code (Oregon Amended)</td>
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<td>NFPA</td>
<td>National Forest Products Association or National Fire Protection Association</td>
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<tr>
<td>NLPB</td>
<td>Northwest Lath &amp; Plaster Bureau</td>
</tr>
<tr>
<td>NIST</td>
<td>National Institute of Standards and Technology</td>
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<td>NPDES</td>
<td>National Pollutant Discharge Elimination System</td>
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<td>NSPE</td>
<td>National Society of Professional Engineers</td>
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<td>Oregon Administrative Rules</td>
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<td>Oregon Revised Statutes</td>
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<td>Occupational Safety and Health Administration, US Dept of Labor</td>
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<td>PCA</td>
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<td>PCI</td>
<td>Precast/Prestressed Concrete Institute</td>
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<td>PDCA</td>
<td>Oregon Council, Painting and Decorating Contractors of America</td>
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<td>PUB</td>
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<td>RMA</td>
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<td>SIGMA</td>
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<td>SSPC</td>
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<td>UL</td>
<td>Underwriters Laboratory, Inc.</td>
</tr>
<tr>
<td>UBC</td>
<td>Uniform Building Code</td>
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</tbody>
</table>
3. CONTRACT DOCUMENTS

3.1 The Contract Documents supersede Bidding Documents that are not expressly incorporated in the Contract Documents by the Agreement. The Contract Documents constitute the entire agreement between the Parties concerning the Work. The Contract Documents are complementary. References to “this Contract” or “the Contract” in any Contract Document will include all Contract Documents.

3.2 SHMC intends that the Contract Documents provide for complete, correct, and timely execution of the Work. If the Contract Documents do not describe all details of the Work, details that are necessary to produce the intended result will be inferred.

3.3 Addenda that modify a Contract Document and exhibits and other documents incorporated by reference in a Contract Document will be integral parts of that Contract Document, and references to that Contract Document will include such addenda, exhibits, and other documents.

3.4 If the Contractor finds inconsistencies in the Contract Documents, or is uncertain about the meaning of the Contract Documents, or contends that the Contract Documents are defective in any way, the Contractor shall immediately notify the Contract Administrator of the problem. If necessary, the Contractor shall stop any Work in question until the Contract Administrator issues a written interpretation of the Contract Documents. Any interpretation will be issued in the same manner as a notice under Section 6 as soon as practicable after the Contract Administrator is notified of the problem. The interpretation should be consistent with Subsections 3.5 and 3.6, and it will be an integral part of the Contract Document that it interprets and will be binding on the Parties, unless it is arbitrary. If the Contractor contends that the interpretation constitutes a Work Change Directive or otherwise affects the cost of the Work or the Contract Time, the Contractor may give notice of a Claim.

3.5 The Contract Administrator should consider the following order of priority in addressing inconsistencies in the Contract Documents (the document named in Subsection 3.5.1 takes priority over all others and so on in descending order):

3.5.1 Change Orders and Amendments.
3.5.2 Work Change Directives.
3.5.3 Field Orders.
3.5.4 Agreement.
3.5.5 Supplementary Conditions.
3.5.6 General Conditions.
3.5.7 Specifications.
3.5.8 Plans.
3.5.9 The Contractor’s Bid.

3.6 Amendments, Change Orders, Work Change Directives, Field Orders, and Addenda of a later date will take priority over those of an earlier date. Numbers in Specifications or on Plans should take priority over scaled measurements. Larger scale Plans should take priority over smaller scale Plans. If Specifications or Plans are inconsistent, the document or provision of a document that will result in the better quality of Work will take priority.

3.7 If a provision of a Contract Document is held by a court to be invalid, it will not affect the validity of other provisions, and the Contract Documents will be interpreted as if the invalid provision did not exist.

3.8 The Contract Documents may be modified only by Amendment, Change Order, Work Change Directive, Field Order, or a written interpretation under Subsection 3.4, and not by any oral understanding, statement, or agreement. Change Orders are subject to the limitations stated in Subsection 24.2. Amendments must be signed by the Contract Administrator, the County Counsel and SHMC.

4 ADMINISTRATION OF CONTRACT

4.1 The authority of the Contract Administrator, Inspectors, Consultants, and other representatives of SHMC to take actions or make decisions on behalf of SHMC is limited to those actions and decisions delegated by or pursuant to the Contract Documents. By signing the Agreement, SHMC authorizes the Contract Administrator and other representatives of SHMC to take actions that are described in the Contract Documents.

4.2 SHMC has ultimate authority to delegate or restrict the administrative authority of officers, employees, and agents of SHMC. SHMC will notify the Contractor of any decision by SHMC that affects the authority of representatives of SHMC.

4.3 Authority to act on behalf of SHMC that is not properly delegated to others is reserved by SHMC. The Contractor will not rely on any agreement, directive, decision approval, or other action by anyone who is not authorized to act on behalf of SHMC in accordance with the Contract Documents.

4.4 Unless a particular provision of a Contract Document specifically states otherwise, if a Contract Document refers to an action and decision by SHMC, it will be taken or made by the Contract Administrator who is named in the Agreement, a replacement designated by SHMC pursuant to Subsection 4.1, or a person to whom the Contract Administrator has delegated authority pursuant to Subsection 4.1.
4.5 Subject to particular limitations stated in the Contract Documents, the Contract Administrator may delegate authority to other representatives of SHMC to make decisions and take actions on behalf of the Contract Administrator, except for authority to issue Work Change Directives and sign Change Orders, and references in the Contract Documents to the Contract Administrator will be deemed to include such representatives. The Contract Administrator will give the Contractor notice of any delegation under this subsection.

4.6 Subject to the provisions on Claims, the Contract Administrator will decide all issues concerning control of the Work, including:

4.6.1 Approval or rejection of the Progress Schedule, the Schedule of Values, Subcontracts, Materials, Substitutes, Submittals, and Work.
4.6.2 Measurement of Unit Price Work;
4.6.3 Requirements of Field Orders and Work Change Directives;
4.6.4 Acceptability of rates of progress on the Work;
4.6.5 Interpretation of the Plans and Specifications; and
4.6.6 Payments that are due under the Contract Documents.

4.7 Unless otherwise stated, if a provision of the Contract Documents states that an act, thing, or document is subject to the approval or consent of SHMC or the Contract Administrator, both the request for approval or consent and the approval or consent must be written and must be given in the same manner as notices under Section 6. Approval or consent will not be withheld unreasonably.

4.8 Unless otherwise stated, if a provision of the Contract Documents states that the Contract Administrator may direct the Contractor to take or refrain from taking certain action, the directive should be written and given in the same manner as notices under Section 6.

4.9 The Contractor shall designate, by notice to SHMC, at least one person who is authorized to take actions on behalf of the Contractor that are necessary for efficient administration of the Contract, including execution of Change Orders and Amendments. Any action or decision concerning the Contract Documents that is made by a representative designated by the Contractor pursuant to this subsection will be valid and binding on the Contractor.

5 WAIVER - Unless a particular provision of the Contract Documents provides otherwise, compliance with requirements of the Contract Documents may be waived only by a written waiver signed by the Party waiving its rights. Waiver of compliance with one requirement in one instance will not be deemed to waive compliance with that requirement in any other instance or to waive any other requirement.
6 NOTICES

6.1 Any notice required by the Contract Documents must be written and must be given by personal delivery or mail, unless the Contract provision requiring the notice or Applicable Law allows or requires a different method of notice.

6.2 Notices to SHMC will be directed to the Contract Administrator at the address stated in the Agreement. Notices to the Contractor will be delivered to the Contractor’s superintendent at the Work Site or mailed or delivered to the Contractor at the address stated in the Agreement.

6.3 Each Party shall notify the other of any change of address.

7 ASSIGNMENT The Contractor shall not assign or transfer the Contractor’s rights and obligations under this Contract without the prior written consent of SHMC.

8 DOCUMENTS PROVIDED BY SALMON HARBOR MANAGEMENT COMMITTEE

8.1 The Contract Administrator will provide to the Contractor the number of copies of the Contract Documents that the Contract Administrator determines are sufficient for executing the Work. The Contractor may purchase additional copies for the cost of reproduction.

8.2 The Contract Administrator will endeavor to locate and provide to the Contractor all Documents within the possession or control of SHMC that contain information concerning physical conditions that the contractor may encounter at the Work Site. SUCH DOCUMENTS AND INFORMATION MAY NOT BE COMPLETE OR ACCURATE, AND SHMC MAKES NO WARRANTIES CONCERNING SUCH DOCUMENTS AND INFORMATION.

8.3 If necessary for performance of the Work, the Contract Administrator will furnish a legal description of the Work Site and copies of surveys of the work Site possessed by SHMC.

9 NO REPRESENTATIONS – No statements, discussions, or representations by any representative of SHMC about the Work, the Work Site, or the requirements of the Contract documents will affect the rights or obligations of the Parties unless they are written and included in the Contract Documents or made in accordance with the provisions of the Contract Documents.

10 PRECONSTRUCTION CONFERENCE

10.1 Within ten (10) days after the Contractor signs and returns the Agreement with the proper bonds and insurance certificates, but before Work begins at the Work Site, the Contractor’s representatives, the Contract Administrator, and others designated by SHMC or the Contract Administrator will hold a preconstruction conference to discuss the procedures for handling Submittals,
Applications for Payment, and other matters pertaining to administration of the Contract.

10.2 At the preconstruction conference, the Contractor shall submit a proposed Progress Schedule for the Work which will be subject to approval under Subsection 26.3 and a proposed Schedule of Values which will be subject to approval under Subsection 43.2.

11 CONTRACTOR’S RECORDS

11.1 The Contractor shall keep current records concerning the Work that are sufficient for evaluating the Contractor’s performance under the contract documents, including financial records, correspondence, records concerning Subcontracts and contracts with Suppliers, Product Data, documentation of Claims, and records required by Applicable Laws.

11.2 During the progress of the Work, the contractor shall keep at the Work Site a copy of current As Built Documents, Documents required to be kept at the Work Site by Applicable Laws, and other documents that the Contract Administrator requests by notice to the Contractor.

11.3 As-Built Documents, warranties for Materials, manuals, Product Data, Shop Drawings, and other Documents produced or obtained by the Contractor, Subcontractors, and Suppliers in connection with the Work that will be needed for use, maintenance, repair, renovation, reconstruction, or completion of the Work will belong to SHMC, and the Contractor shall deliver such Documents to the Contract Administrator upon completion of the Work or upon termination of this Contract.

11.4 The Contractor shall allow SHMC to examine and copy Documents within the possession or control of the Contractor that are pertinent to the Contract while the Work is in progress and within six years after termination of the Contract or completion of the Work. This provision applies to Documents that may be otherwise privileged.

11.5 SHMC will endeavor to honor requests by the Contractor to forgo disclosure of Documents provided by the Contractor which the Contractor believes in good faith to be “trade secrets” or otherwise confidential and designates as such. The County Counsel has exclusive discretion to determine whether a request to keep Documents confidential is consistent with ORS 192.501 to 192.502.

12 CONTRACTOR’S RESPONSIBILITY FOR THE WORK

12.1 By executing this Contract, the Contractor acknowledges that the Contractor:

12.1.1 Has carefully examined the Contract Documents, other pertinent Documents, and all available information concerning physical conditions at the Work Site;
12.1.2 Has determined that labor, construction equipment, and Materials that are needed for the Work are available;
12.1.3 Has notified the Contract Administrator of errors, ambiguities, or inconsistencies in the Contract Documents; and
12.1.4 Is not relying on representations by any officer, employee, or agent of SHMC about the Work that are not included in or made pursuant to the Contract Documents.

12.2 The Contractor is responsible for the entire Work. Unless particular contract Documents specifically require or allow otherwise, the Contractor shall:

12.2.1 Furnish and pay for all Materials and other Goods, tools, construction equipment, labor, utilities, transportation, personal services, fuel, facilities, and documents that are required by the Contract Documents, or that should be inferred from the Contract Documents as necessary to complete the Work, whether Pay Items or Incidental Work;
12.2.2 Perform the Work in accordance with the Contract Documents and generally accepted trade and industry standards;
12.2.3 Diligently prosecute the Work without interruption in accordance with the approved Progress Schedule;
12.2.4 Control the actions of all persons who are engaged in the Work and assure that they comply with the Contract Documents; and
12.2.5 Cooperate with other prime contractors who are working on the Project as stated in the Contract Documents.

12.3 Unless specific provisions of the Contract Documents state otherwise, the Contractor shall pay all costs incurred in performance of the Contractor's obligations under the Contract Documents.

12.4 The Contractor shall supervise the Work to assure timely, proper execution of the Work. The Contractor shall employ a competent superintendent who is experienced in the type of Work being performed and who is capable of understanding the Plans and Specifications. The superintendent must be available to confer with the Contract Administrator regularly about the progress of the Work and must be at the Work Site when substantial operations of the Contractor or Subcontractors are in progress. If the Contractor’s superintendent does not have authority to execute Change Orders under Subsection 4.9, a person who does have such authority must be readily available to act on behalf of the Contractor.
12.5 The obligations of the Contractor under the Contract Documents regarding performance of the Work will apply to Subcontractors and Suppliers with respect to the Work that they perform and the Materials that they supply, and the contractor will be responsible for such Work and Materials.

13 WORKERS

13.1 The Contractor and Subcontractors shall provide competent, qualified workers. Workers must have any licenses and certificates required by Applicable Laws for performing the Work to which they are assigned.

13.2 The Contractor shall comply with reasonable directions from the Contract Administrator to exclude workers from the Work Site who are careless, incompetent, or disruptive.

14 MATERIALS

14.1 Materials provided by the Contractor must conform to the Specifications; must be of good, merchantable quality; and must be fit for the purpose for which they are used. With respect to Materials, the Contractor is a “merchant” of Goods under ORS Chapter 72.

14.2 Equipment must be new, current models of standard production. Equipment must be cleaned, conditioned, installed, and connected in accordance with instructions of the manufacturer.

14.3 If required by the Specifications, the Contractor, at the Contractor’s expense, shall have Materials tested before they are incorporated in the Work. Upon completion of tests, the Contractor shall provide the test results to the Contract Administrator who will approve or reject Materials by notice to the Contractor. Such notice will state any conditions of approval or reasons for rejection.

15 SUBSTITUTES

15.1 The Contractor may propose supplying a Substitute that is equivalent to a Specified Product. The Contract Administrator may refuse to approve a Substitute that could have resulted in lower bids from all bidders if approval had been requested during the bidding process. The Contractor shall provide a written statement of compelling reasons for the Contractor’s failure to request approval of the Substitute prior to bid submission. The Contractor shall document the following information and any other information requested by the Contract Administrator for evaluation of the proposed Substitute:

15.1.1 Technical characteristics of the Substitute;
15.1.2 Past performance and reliability of the Substitute when used for purposes similar to the intended use for the Specified Product;
15.1.3 Advantages and disadvantages of using the Substitute in comparison with the Specified Product;
15.1.4 Changes in the Work and changes in the Contract Time that will be necessary to use the Substitute;
15.1.5 Costs of providing, using, and maintaining the Substitute; and
15.1.6 Warranties, requirements for maintenance of the Substitute, and availability of maintenance and repair service.

15.2 The Contractor shall certify that all information regarding the Substitute provided by the Contractor is true and complete and that the performance of the Substitute will be equal or superior to the Specified Product when used for the specified purpose or function.

15.3 The Contract Administrator has complete discretion to approve or reject a Substitute. Approval of a Substitute will be documented by a Change Order. The Contract Administrator may revoke approval of Substitute, and require the contractor, at the Contractor’s expense, to replace the Substitute if the Contract Administrator deems the Substitute unsatisfactory after it is incorporated in the Work. If a Substitute is approved, the Contractor will be solely responsible for the resulting Work.

15.4 The Contractor shall pay all costs associated with a request for substitution regardless of whether it is approved, including costs incurred by SHMC in reviewing and acting on the request. If the cost of using the Substitute is less than the cost of using the specified Product, SHMC will be entitled to a commensurate reduction in the Contract Price. Unless the Change Order allowing a Substitute states otherwise, the Contract Price will not be increased for use of the Substitute.

16 CONTRACTOR’S CONSTRUCTION EQUIPMENT AND METHODS

16.1 Construction equipment used by the Contractor to perform the Work must be in good operating condition and must be adequate for efficient performance of the Work.

16.2 Unless the Contract Documents require use of a specific Construction Method, the Contractor will be responsible for determining what Construction Methods are appropriate for performing the Work. If the Contract Documents require a specific Construction Method, the Contractor may request approval to use a different Construction Method in the same manner as a request for approval of a Substitute under Section 15. If the Contractor’s request is approved, the Contractor will be solely responsible for the resulting Work.

17 SUBCONTRACTS

17.1 If the value of the contract is $100,000 or more, within two (2) hours of the date and time of the deadline when the bids were due, a bidder shall submit to
SHMC the names, addresses and Construction Contractors Board registration numbers of any first tier subcontractor that will be furnishing labor or will be furnishing labor and materials in connection with the work and whose contract value is equal to or greater than 5% of the total project bid or $15,000, whichever is greater, or $350,000 regardless of the percentage of the project bid.

17.2 Any Work that is performed by a person who is not hired and paid as an employee of the Contractor, including Work performed with construction equipment that is rented with an operator, must be performed under a written Subcontract that is approved pursuant to this section. A prospective Subcontractor must qualify as an independent contractor under ORS 670.600.

17.3 The Contractor shall not enter into Subcontracts for the Work, allow a Subcontractor to subcontract Work at a lower tier, or allow assignment of a Subcontractor’s interest in a Subcontract without the prior approval of the Contract Administrator. The Contractor shall submit a request to the Contract Administrator with a copy of the proposed Subcontract or assignment. The Contractor shall document the qualifications of a proposed Subcontractor as directed by the Contract Administrator. The Contractor will be notified of the Contract Administrator’s decision regarding a proposed Subcontract within seven (7) days after the Contract Administrator receives all documents required by this section. The Contract Administrator may reject a Subcontractor for any of the reasons stated in ORS 279C.440(2) with respect to disqualification of bidders and shall reject the subcontract if the subcontractor is on the list created by the Construction Contractors Board in accordance with ORS 701.227(4). The Contract Administrator will not approve a Subcontract that merely provides a labor force for the Work.

17.4 Subcontracts must correlate with the Specifications and Plans for the subcontracted Work. Subcontracts must state that the Subcontractor is bound by relevant provisions of the Contract Documents concerning control and execution of the Work and administration of the Contract and other provisions that benefit or protect the interests of SHMC.

17.5 A Subcontract must state that the Subcontractor will defend and indemnify SHMC and its officers, employees, and agents from all Third-Party Claims arising out of the Subcontractor’s negligence, breach of the Subcontract, or other wrongful acts and omissions of the Subcontractor. A Subcontractor must provide the same liability insurance coverage and workers’ compensation coverage that is required of the Contractor. Proof of such coverage that conforms to Sections 39 and 40 must be provided to the Contract Administrator before the Subcontractor performs Work at the Work site.

17.6 Pursuant to ORS 279C.580(3), the Contractor shall include the following in every subcontract for property or services entered into by the contractor or a first-tier subcontractor (including material suppliers):
17.6.1 A payment clause which obligates the Contractor to pay the first-tier subcontractor for satisfactory performance of its subcontract within ten (10) days out of such amounts as are paid to the Contractor by SHMC under the contract; and

17.6.2 An interest penalty clause that obligates the Contractor, if payment is not made within thirty (30) days after receipt of payment from SHMC, to pay to the first tier subcontractor an interest penalty on amounts due in the case of each payment not made in accordance with the payment clause included in the subcontract under Section 17.6.1. The interest penalty shall be calculated pursuant to ORS 279C.580(3)(B) and ORS 279C.515(2), on amounts due in the case of each payment not made in accordance with section 17.6.1.

17.6.3 If the only reason that the Contractor or first tier subcontractor did not make the payment when due is that the contractor or first tier subcontractor did not receive payment from SHMC or the Contractor when payment was due, then the Contractor or first tier subcontractor may not be obligated to pay the interest penalty.

Pursuant to ORS 279C.580(4), the Contractor shall require each Subcontractor to include in each lower tier Subcontract a payment clause and an interest penalty clause conforming to ORS 279C.580(3).

17.7 Each Subcontract shall require the Subcontractor to consent to assignment of the Contractor’s interest in the Subcontract, and the Contractor’s interest in each Subcontract is hereby assigned to SHMC subject to the following conditions:

17.7.1 An assignment will be effective only if SHMC gives the Subcontractor written notice that SHMC is accepting the assignment after termination of this Contract; and

17.7.2 Assignment will be subject to the prior rights of the surety under the performance bond for the Contract.

17.8 Unless assignment of Subcontracts is effected pursuant to Subsection 17.7:

17.8.1 The Contractor shall coordinate the Work of Subcontractors and require Subcontractors to communicate with the Contract Administrator through the Contractor;

17.8.2 Subcontractors shall not make direct Claims against SHMC; and

17.8.3 The Contractor will be responsible for all Work performed by Subcontractors.

17.9 The Contract Administrator’s approval of a Subcontract or assignment or amendment of a Subcontract will not diminish the Contractor’s responsibility
for all subcontracted Work or release the Contractor or its surety of their responsibilities under the Contract Documents and bonds.

18 USE OF PREMISES

18.1 SHMC will allow the Contractor to have access to the Work site and use of the Work site as necessary for performance of the Work. The Contractor shall confine the Work to the Work Site and areas that the Contractor is allowed to use for access to the Work Site as described in the Contract Documents.

18.2 The Contractor shall accommodate regular use of the Premises and provide any temporary facilities necessary for safe use of the Premises. The Contractor shall not unreasonably obstruct use of the Premises or allow debris from the Work to accumulate. Upon completion of the Work, the Contractor shall remove from the Premises all debris resulting from the Work and the contractor’s personal property and leave the Premises clean and ready for use by SHMC.

19 SAFETY AND PROTECTION OF PROPERTY

19.1 The Contractor is responsible for safety at the Work Site and shall take reasonable precautions to prevent injury to persons and damage to property that may result from the Work. The Contractor shall provide safety facilities required by Applicable Laws.

19.2 Unless prohibited by Applicable Laws, in emergencies, the Contractor shall take immediate, appropriate actions necessary to prevent or mitigate injury or loss. If an emergency is not caused in whole or in part by acts or omissions for which the Contractor is responsible under the Contract Documents, the Contractor will be compensated for actions taken pursuant to this subsection in the same manner as for Changes in the Work. Otherwise, the Contractor will bear the cost of any precautionary and emergency measures taken under this section.

19.3 If the Contractor determines that Construction Methods required by the Contract Documents are not safe, the Contractor shall give the Contract Administrator notice and may propose safer alternatives in the same manner as Substitutes. If the Contract Administrator does not approve the alternative Construction Method proposed by the Contractor pursuant to this subsection, SHMC will be responsible for any third-party claim or damage to the Work that results solely from the construction Method required by the Contract Documents.

19.4 The Contractor shall take adequate measures to protect the Work and Materials stored at the Work site from fire, weather, vandalism, theft, and other foreseeable loss.

19.5 The Contractor will be responsible for all damage to SHMC’s real and personal property resulting from the Work, and the contractor will compensate SHMC
for such damage upon receipt of notice from the Contract Administrator describing the damages suffered by SHMC.

20 COOPERATION WITH UTILITIES

20.1 Utilities that are located at the Work Site will be indicated on the Plans if the location is known to SHMC, and SHMC will provide to the Contractor any information in SHMC’s possession concerning existing utilities, subject to the limitations stated in Section 8. The contractor will be primarily responsible for determining the location of utilities by reviewing information provided by SHMC, contacting utility owners, and uncovering utilities at the Work Site.

20.2 SHMC will exercise any power that SHMC has under Oregon Law to require Utility owners to alter or relocate Utilities to accommodate the Work in a timely manner.

20.3 If Utilities must be altered or moved temporarily or permanently to accommodate the Work, the Contractor shall coordinate the Work with the Utility owners. Unless specific provisions of the Contract Documents state otherwise, or unless the Contractor makes other arrangements with a Utility owner, Utilities will be altered or relocated by the Utility owner. The Contractor may agree with a Utility owner to make changes in a Utility that differs from the Plans subject to the consent of the Contract Administrator, but the Contractor shall bear the cost of such changes.

20.4 If Contractor discovers an unanticipated Utility at the Work Site, the Contractor shall determine the owner of the Utility, and notify the owner and the Contract Administrator. The Contractor shall not disturb any unanticipated Utility, and shall protect the Utility until the Contract Administrator determines whether a Change in the Work is necessary and directs the Contractor to act accordingly.

21 SUBMITTALS

21.1 Submittals are not Contract Documents. The purpose of Submittals is to demonstrate the way in which the Contractor intends to implement those portions of the Work for which submittals are required under the Contract Documents. Informational Submittals to which the Contract Administrator is not expected to respond will be identified in the Contract Documents.

21.2 The Contractor shall provide Samples, Shop Drawings, Product Data, and other Submittals to the Contract Administrator as required by the Contract Documents. The Contractor shall provide Submittals promptly and in proper sequence to allow for orderly progress of the Work.

21.3 The Contractor shall give special attention to details of Submittals that have been revised at the direction of the Contract Administrator.

21.4 The Contractor shall not perform any Work covered by a Submittal until the Submittal is approved by the Contract Administrator.
21.5 Unless the Contractor gives notice to the contrary at the time that the contractor provides a Submittal, the contractor shall be deemed to certify that:

21.5.1 The Submittal conforms to the Specifications;
21.5.2 Any Sample is representative of the Material that will be used for the Work; and
21.5.3 Information contained in a Submittal, including information on composition, quantities, dimensions, field measurements, performance criteria, fabrication, assembly, and installation requirements, is true and correct.

21.6 The Contract Administrator is entitled to rely on technical and professional certifications contained in Submittals and the Contractor will be responsible for such certifications.

21.7 The Contract Administrator will either approve, reject, or direct the Contractor to revise a Submittal, unless it is merely an informational Submittal that does not necessitate a response.

21.8 The Contract Administrator’s approval of a Submittal will not relieve the Contractor of responsibility for errors or deficiencies in the Submittals or waive requirements of the Contract Documents.

22 INSPECTION OF WORK

22.1 The Contractor shall inspect all Work as it progresses to assure that it conforms to the Contract Documents.

22.2 If Applicable Laws require any Work to be inspected by a Governmental Agency, the Contractor shall arrange for the inspection; notify the Contract Administrator in advance of the inspection; and provide copies of Documents resulting from such inspection to the Contract Administrator. If a Governmental Agency determines that certain Work does not conform to Applicable Laws, such Work will be considered defective for purposes of this section.

22.3 If certain Work is subject to inspection and approval by SHMC under the Contract Documents, the Contractor shall give Inspectors oral notice with written confirmation at least three (3) Working Days before the Work will be ready for any inspection. The Contractor shall provide safe access to the Work for the Inspector to perform the inspection. Within three (3) Working Days after receiving written notice from the Contractor, the Inspector will inspect the Work; recommend rejection or approval of Work to the Contract Administrator; give oral notice of such recommendation to the Contractor, and confirm such notice in writing. Inspectors cannot alter or waive requirements of the Contract Documents.

22.4 All work will be subject to the approval of the Contract Administrator following inspection pursuant to Subsection 22.3. work will be deemed “defective” if the
Contract Administrator determines that it does not conform to the Contract Documents. The Contract Administrator will give the Contractor oral notice, followed by written confirmation, of approval or rejection of Work within three (3) Working Days after the Contract Administrator receives a recommendation on such Work from the Inspector. The Contract Administrator may elect to inspect work to confirm the Inspector's recommendation.

22.5 Except as provided in Subsection 22.6, SHMC will bear the cost of initial inspection of Work by SHMC, and the Contractor shall pay the cost of all other inspections.

22.6 The Contract Administrator may require the Contractor to uncover completed Work for inspection. SHMC will compensate the Contractor for the expense of uncovering and restoration of the Work in the same manner as for a Change in the Work only if all of the following conditions occur:

22.6.1 The Contractor gives timely notice to the Inspector before covering the Work;
22.6.2 The Inspector fails to inspect within a reasonable time;
22.6.3 The Contractor subsequently covers the Work;
22.6.4 The Contract Administrator directs the Contractor to uncover the Work; and
22.6.5 The uncovered Work is not defective.

22.7 The Contract Administrator may require the Contractor to correct defective Work. The Contractor will bear the cost of correcting defective Work, unless the defect is caused solely by SHMC.

22.8 In lieu of requiring the Contractor to correct defective Work for which the Contractor is responsible, the Contract Administrator may reduce the Contract Price by Work Change Directive in an amount determined adequate by the Contract Administrator to compensate SHMC for the reduction in the value of the completed Work, including diminished utility of the Work and the estimated costs of maintenance, and repair of the Work affected by the defect.

22.9 Notices required by this section will be given to the Inspector or the Contract Administrator or the Contractor’s superintendent at the Work Site.

22.10 Approval of Work in Progress is subject to final approval prior to Contract closeout.

22.11 Inspection and approval of the Work by SHMC will not relieve the Contractor of responsibility for the Work.

23 MANUALS AND TRAINING

23.1 Operation and maintenance manuals for use of Equipment must be approved by the Contract Administrator in accordance with the procedures for Submittals, and the Contractor must correct deficiencies in those Documents as directed by the Contract Administrator before training begins.
23.2 Prior to Substantial Completion, the Contractor shall provide training to SHMC’s personnel for operation and maintenance of Equipment as required by the Specifications.

24 CHANGES IN THE WORK

24.1 Additions to the Work, elimination of Work, and other Changes in the Work may be necessary for proper completion of the Project. Subject to limitations imposed by the Contract Documents and Applicable Laws, SHMC may, at any time, without notice to sureties, make changes in the Specifications, Plans, the Progress Schedule, and other Contract Documents.

24.2 The Contractor shall comply with all Field Orders, Work Change Directives, and Change Orders. The Contract Administrator may issue a Field Order for a Change in the Work that does not affect the cost of the Work or the time required to perform the Work. The Contract Administrator is authorized by SHMC to issue Work Change Directives and sign Change Orders, so long as any Work change Directive or Change Order does not increase the Contract Price by more than 10% of the Contract Price or $25,000, whichever is less. Any work change Directive or Change Order that will increase the Contract Price by more than the preceding amounts must be signed by SHMC.

24.3 SHMC does not warrant that the actual quantities of Unit Price Work will correspond with the estimated quantities stated in the Contract Price Schedule. The Parties expect variations in the quantities of Unit Price Work, and a variation will be deemed a Change in the Work that justifies a change in the Contract Price or the Contract Time only if the Contract Administrator determines that:

24.3.1 The difference between the estimated quantity and the actual quantity significantly changes the character of Work, the cost per unit, or the time needed to complete the Work; and

24.3.2 Either SHMC or the Contractor will suffer substantial inequity if the Contract Price or the Contract Time is not changed.

24.4 If the Contract Administrator requests a Change in the Work that will affect the cost of the Work or the time required to perform the Work, and the Parties agree on corresponding changes in the Contract Price or the Contract Time or both, the Parties will execute a Change Order. A Change Order may be executed at any time to supersede a Field Order or a Work Change Directive.

24.5 If SHMC requests a Change in the Work that will affect costs or time, but the Parties do not agree on adjustment of the Contract Price or the Contract Time, SHMC will issue a work change Directive. The Contractor will implement the Work change Directive, keeping accurate, complete records on resulting
changes in the cost of the Work and the time required for the Work. The Contractor will provide copies of such records and other information requested by the Contract Administrator to evaluate the effects of a Work Change Directive. Within a reasonable time after receiving such information, SHMC will either affirm the initial Work Change Directive or issue a supplemental work Change Directive increasing or decreasing the Contract Price or the Contract Time or both in accordance with Sections 25 and 26 to compensate the Contractor for the Change in the Work.

24.6 If the Contractor does not agree to a change in the Contract Price or a change in the Contract Time as determined by a Work Change Directive, or if the Contractor contends that a change directed by Field Order affects the cost of the Work or the time required to perform the Work, or if the Contractor contends that the Contractor is otherwise entitled to a change in the Contract Time or the Contract Price, the Contractor may submit a Claim in accordance with the Contract Documents.

25 CONTRACT PRICE

25.1 The Contract Price, as adjusted pursuant to the Contract Documents, constitutes the sole and total compensation payable to the Contractor for the Work and will cover all costs incurred by the Contractor in performance of the Work.

25.2 Unless the character of Work covered by a Pay Item that is designated as Lump Sum is changed substantially, the Contractor will be paid the amount stated in the Contract Price Schedule for that Pay Item. Unless a variation in the quantity of Unit Price Work constitutes a Change in the Work under Subsection 24.3, the amount payable for Unit Price Work will be the Unit Price multiplied by the actual quantity furnished or performed by the Contractor. Unless otherwise provided in the Contract Documents, the Contractor will be paid only for Pay Items and not for Incidental Work.

25.3 The Contractor will be entitled to an increase in the Contract Price for a Change in the Work that increases the cost of the Work. SHMC will be entitled to a decrease in the Contract Price for any Work that is eliminated for any Change in the Work that reduces cost of the Work. Increases and decreases resulting from a single Change in the Work or contemporaneous Changes in the Work will be offset.

25.4 The price of a Pay Item that is eliminated by a Change in the Work will be deducted from the Contract Price, but the Contractor will be reimbursed for actual direct costs incurred by the Contractor, a Subcontractor, or a Supplier for acquisition of special materials, special construction equipment, and other items provided solely for the eliminated Work, to the extent that such costs cannot be mitigated by the Contractor, the Subcontractor, or the Supplier. The price of each Pay Item is presumed to include an appropriate share of the
Contractor’s overhead and profit, so the Contractor will not be entitled to any payment for loss of anticipated profits for eliminated Work.

25.5 If the character of Work covered by a Lump Sum is changed substantially, but the Pay Item is not eliminated, the Lump Sum price will not apply, and payment for that Work will be based on the cost of the Work as determined under Subsections 25.6 through 25.10. If a variation in the quantity of Unit Price Work constitutes a Change in the Work under Subsection 24.3, but the Unit Price Work is not eliminated, the Unit Price will not apply and payment for that Work will be based on the cost of the Work as determined under Subsections 25.6 through 25.10.

25.6 Unless the Parties agree otherwise in writing, the amount of any increase or decrease in the Contract Price for a Change in the Work, other than elimination of a Pay Item, will be based on the direct cost of the changed Work and the mark-up allowed by this section as determined by the Contract Administrator.

25.7 The direct cost of a Change in the Work comprises:

25.7.1 Salaries, wages, social security contributions, payroll taxes, unemployment insurance, workers’ compensation, fringe benefits, and costs for the labor or services of employees engaged in the Work;

25.7.2 The reasonable cost of construction equipment which will be determined by the Contract Administrator in accordance with standards established by the Contract Documents or other reasonable standards selected by the Contract Administrator;

25.7.3 Fuel, oil, and other Goods regularly consumed by operation of construction equipment;

25.7.4 Cost of Materials used for the Work;

25.7.5 Reasonable extra payments by the Contractor to key employees for necessary transportation, travel, and subsistence;

25.7.6 Taxes directly related to the Work;

25.7.7 Extra premiums for increased bond and insurance coverage attributable to the Change in the Work; and

25.7.8 Extraordinary and incidental expenditures directly related to the Change in the Work.

25.8 The direct cost of a change in the Work will not include Overhead and anticipated profit; costs resulting from the negligence, breach of contract, or other wrongful acts or omissions of the Contractor; the cost of correction of defective Work; the cost of small tools that are customarily provided by Workers; or costs for which the Contractor is responsible under other provisions of the Contract Documents.

25.9 For additive Changes in the Work, the following mark-ups will be applied to direct costs of additional Work to cover the Contractor’s Overhead and profit:

Labor performed by the Contractor’s employees...... 17%
Construction equipment and Materials provided by the Contractor  
........................................................................................................12%
Labor, construction equipment, and materials provided by a Subcontractor an additional..........................................................5%

25.10 For reductive changes, the Contract Price will be reduced by direct costs eliminated by the Change in the Work, and if the reductions in direct costs constitute more than 10% of the Contract Price, the Contract Administrator may elect to further reduce the Contract Price in an amount equal to the reduction in direct cost multiplied by percentages stated in Subsection 25.9.

26 CONTRACT TIME

26.1 The Contract Time may be expressed in the Specifications by a calendar date on which the Work must be completed or as a certain number of calendar days. When the Contract Time is stated as a certain number of calendar days, counting will begin at 12 AM on the fifteenth day after the date of the Award. Saturdays and holidays will be counted as calendar days.

26.2 The Contract Administrator will issue the Notice to Proceed within five (5) days after the preconstruction conference. Upon receiving the Notice to Proceed, the Contractor shall begin the Work and shall diligently prosecute the Work.

26.3 The Progress Schedule submitted by the Contractor at the pre-construction conference must realistically provide for completion of the Work within the Contract Time. Within ten (10) days after receiving the proposed Progress Schedule, the Contract Administrator will either approve it or return it to the Contractor for revisions. Upon making changes in the Progress Schedule, the process for approval will be repeated until the Progress Schedule is approved. The approved Progress Schedule will be part of the Contract Documents. The Contract Administrator’s approval of the Progress Schedule will not constitute approval of the Contractor’s Construction methods or durations. The Progress Schedule will be adjusted as directed by the Contract Administrator to conform to changes in the Contract Time.

26.4 The Contract Administrator will determine and record the passage of the Contract Time and will provide Statements of the Contract Time (hereinafter SCT) to the Contractor which will include any adjustments made pursuant to this section. SCT will be provided at least monthly for projects of more than two (2) months duration and weekly for projects of less than two (2) months’ duration. Change Orders which adjust contract time shall be deemed to be an SCT.

26.5 The Contractor shall notify the Contract Administrator of any delay within five (5) days after the Contractor knows of the delay. Such notice must state the reason for the delay, the estimated duration of the delay, the net delay to completion of the Work, and any adjustment of the Contract Time that the Contractor is requesting. If the Contractor fails to recognize and give notice of
a condition or event that will result in a delay within five (5) days after it should be apparent to the Contractor, the Contract Administrator may deny a subsequent Claim for adjustment of the Contract Time because of such event or condition.

26.6 The Contract Time and the Progress Schedule may be adjusted by change Order or Work change Directive consistent with changes in the Work and other events that materially affect the progress of the Work. The Contractor will be entitled to extension of the Contract Time only for:

26.6.1 Unavoidable delays caused by occurrences beyond the Contractor’s control;
26.6.2 Changes in the Work that actually increase the amount of time required to perform the Work; and
26.6.3 Conditions or occurrences for which SHMC is at fault that increase the amount of time required for the Work.

26.7 Actual delays caused by the following conditions or occurrences may be deemed unavoidable and may support an extension of the Contract Time:

26.7.1 Acts of God;
26.7.2 Extremely abnormal adverse weather conditions;
26.7.3 War, riot, and acts of a public enemy;
26.7.4 Freight embargoes and other interruptions of commerce caused by unforeseeable acts of a Governmental Agency;
26.7.5 Suspension of the Work by SHMC because of conditions or events for which the Contractor is not at fault;
26.7.6 Vandalism that could not be prevented by the Contractor;
26.7.7 Fire, explosion, or collapse that is not caused by the negligence or wrongful acts or omissions of the Contractor;
26.7.8 Industry wide strikes or other strikes that are not the result of actions or decisions of the Contractor; and
26.7.9 Extremely unusual physical conditions at the Work Site that could not be foreseen by examination of all available information.

26.8 An extension of the Contract Time will not be allowed for:

26.8.1 Contention by the Contractor that insufficient time was allowed by the original Contract Documents;
26.8.2 Delay which could have been avoided by the Contractor, a Subcontractor, or a Supplier exercising care, foresight, and diligence, including delays caused by shortage of items described in Subsection 12.2.1;
26.8.3 Delay caused by the Contractor’s methods of construction;
26.8.4 An unavoidable delay which affects only part of the Work and does not delay completion of the entire Work within the Contract Time; or
26.8.5 Delay caused by conditions or occurrences for which the Contractor is at fault.

26.9 The Contract Administrator may grant a time extension for avoidable delays if the Contract Administrator determines that it will benefit SHMC.

26.10 If the Contract Administrator determines that the Contractor is not prosecuting the Work in accordance with the Progress Schedule and that the Contractor is not entitled to an extension of the Contract Time, the Contract Administrator may direct the Contractor to revise the Progress Schedule and to accelerate the Work. If the Contractor contends that the Contractor is entitled to an extension of the Contract Time or compensation for the acceleration of the Work, the Contractor may assert a Claim.

27 SALMON HARBOR MANAGEMENT COMMITTEE’S RIGHT TO SUSPEND THE WORK

27.1 The Contract Administrator may suspend all or part of the Work by notice to the Contractor if the Contract Administrator determines that such suspension is necessitated by:

27.1.1 Unsafe conditions at the Work Site;
27.1.2 Defects in the Work;
27.1.3 The Contractor’s breach of contract or violation of Applicable Law;
27.1.4 Directives of any Governmental Agency;
27.1.5 Physical conditions that are unsuitable for performing the Work; or
27.1.6 Other conditions or events that affect substantial interests of SHMC.

27.2 During the suspension, the Contractor will be responsible for protection of the Work, maintenance of access through the Work Site, temporary facilities, and clean-up. Upon receiving notice from the Contract Administrator to resume Work, the Contractor shall restore any Work damaged during the suspension, remove temporary facilities, and proceed with the Work.

27.3 If the Work is suspended because of conditions or events for which the Contractor is at fault, SHMC may recover from the Contractor actual damages suffered by SHMC because of the suspension, including additional administrative expenses and the cost of remedial actions taken by SHMC to correct any problem caused or aggravated by the suspension.

27.4 If the Work is suspended without good cause, or for the convenience of SHMC, or because of conditions or events for which SHMC is at fault, SHMC will compensate the Contractor for any direct costs caused by suspension plus mark-up as provided in Subsection 25.9, and the Contract Time will be extended accordingly.
27.5 If the work is suspended through no fault of the Contractor or SHMC, neither Party shall owe monetary compensation to the other for the suspension, but the Contract Time may be extended.

28 SALMON HARBOR MANAGEMENT COMMITTEE’S RIGHT TO INTERVENE IN THE WORK

28.1 If the Contractor abandons or suspends the Work unilaterally, persistently fails to comply with the Contract Documents, or fails to take actions that are required to prevent or mitigate injury to persons or damage to property or the environment, SHMC may take possession of the Work site, perform the Work with Materials and construction equipment at the Work Site, and take other action that SHMC deems necessary to protect SHMC’s interests, without compensation to the Contractor.

28.2 SHMC may take the actions described in this section before or concurrently with initiation and prosecution of Claims against the Contractor. The Contractor shall reimburse SHMC for the costs incurred by SHMC in taking action pursuant to this section.

29 COMPLIANCE WITH APPLICABLE LAWS

29.1 The Contract Documents will be interpreted and construed in accordance with Oregon law.

29.2 The Parties will comply with all Applicable Laws regardless of whether the laws are cited or stated verbatim in the Contract Documents.

29.3 SHMC will obtain all permits or approvals that are required for the Project by zoning, subdivision, or other land use and development laws. The Contractor shall obtain and pay for all other permits that are required for the Work by Applicable Laws.

29.4 Pursuant to ORS 279A.120(2)(a), the Contractor shall give preference to products that have been manufactured in Oregon, provided that price, fitness, availability, and quality are otherwise equal.

29.5 If the Contractor is not domiciled or registered to do business in the State of Oregon, and the Contract Price exceeds $10,000, the Contractor shall submit reports to the Oregon Department of Revenue as required by ORS 279A.120(3).

29.6 Pursuant to ORS 279C.505, the Contractor shall:

29.6.1 Make payment promptly, as due, to all persons providing to the Contractor labor or Material for the Work.

29.6.2 Pay all contributions or amounts due the Industrial Accident Fund from the Contractor or any Subcontractor incurred in the performance of the Work.
29.6.3 Not permit any lien or claim to be filed or prosecuted against SHMC on account of any labor or Materials furnished.

29.6.4 Pay to the Department of Revenue all sums withheld from employee’s wages pursuant to ORS 316.167.

29.6.5 Demonstrate to SHMC that an employee drug testing program is in place pursuant to ORS 279C.505(2).

29.7 Pursuant to ORS 279C.515, if the Contractor fails, neglects, or refuses to make prompt payment of any Third-Party claim for Work furnished to the Contractor or a Subcontractor by any person in connection with this Contract when due, SHMC may pay such Third-Party Claim to the person furnishing the Work and charge the amount of the payment against funds due or to become due the Contractor by reason of this Contract. SHMC may make payments by check or warrant naming both the Contractor and the person or entity entitled to payment under ORS 279C.515. The payment of a Third-Party Claim in the manner authorized in this subsection will not relieve the Contractor or the Contractor’s surety from the Contractor’s obligations with respect to any unpaid Third-Party Claims.

29.8 Pursuant to ORS 279C.515(2), if the Contractor or a first-tier Subcontractor fails, neglects or refuses to make payment to a person furnishing labor or materials in connection with the work within thirty (30) days after receipt of payment from SHMC for such work, the Contractor or first-tier Subcontractor shall owe the person the amount due plus interest charges commencing at the end of the ten (10) day period that payment is due under ORS 279C.580(4) and ending upon final payment, unless payment is subject to a good faith dispute as defined in ORS 279C.580. The rate of interest shall be computed pursuant to ORS 279C.515(2).

29.9 If the Contractor or a Subcontractor fails, neglects or refuses to pay a Third-Party Claim for materials or services, the Third Party may file a complaint with the Construction Contractors Board, unless payment is subject to a good faith dispute as defined in ORS 279C.580.

29.10 Pursuant to ORS 279C.530, the Contractor shall promptly, as due, make payment to any person or entity that furnishes medical, surgical or hospital care or other needed care and attention, incident to sickness or injury, to the employees of the Contractor, of all sums which the Contractor agrees to pay for such services and all moneys which the Contractor collected or deducted from the wages of the Contractor’s employees pursuant to any law, contract or agreement for the purpose of providing or paying for such service.

29.11 Pursuant to ORS 279C.520 and ORS 279C.540, unless the Contractor is a party to a valid, existing collective bargaining agreement with a labor organization which provides otherwise, no person shall be employed for the Work for more than 10 hours in any one day, or 40 hours in any one week, except in cases of necessity, emergency, or where the public interest absolutely requires it, and in such cases, except for persons who provide
personal services as defined in ORS 279C.100, the employee shall be paid at least time and half pay for:

29.11.1 All overtime in excess of eight hours a day or 40 hours in any one week when the work week is five (5) consecutive days, Monday through Friday;

29.11.2 All overtime in excess of 10 hours a day or 40 hours in any one week when the work week is four consecutive days, Monday through Friday; and

29.11.3 All work performed on Saturday and on any legal holiday specified in ORS 279C.540(1)(B)(b).

29.12 The Contractor and all Subcontractors who perform construction work must be registered with the Construction Contractors Board pursuant to ORS 701.035 to 701.055.

29.13 Any landscape contractor who performs Work described in ORS 671.520 must hold a valid landscape contractor’s license issued under ORS 671.510 to 671.710.

29.14 Any provision of this Contract that reasonably could be deemed to create an obligation that violates the debt limitation of Article XI, Section 10 of the Oregon Constitution will be void.

29.15 The Contractor shall not provide or offer to provide, in connection with this Contract, any appreciable pecuniary or material benefit to any officer or employee of SHMC in violation of ORS Chapter 244 or Douglas County Personnel Rule 20.1.

30 PAYMENT OF PREVAILING WAGE RATES:

30.1 The Contractor and Subcontractors engaged in the Work shall comply with all applicable requirements of ORS 279C.800 to 279C.870. The Contractor and each Subcontractor shall pay to each worker employed by the Contractor or Subcontractor the prevailing rate of wage established by the Commissioner of the Bureau of Labor and Industries for the worker’s trade or occupation. This invitation to bid and the resulting Contract are subject to the following Bureau of Labor and Industries (BOLI) wage requirements which are incorporated by reference: Prevailing Wage Rates for Public Works Contracts in Oregon, July 1, 2014. These BOLI wage rates are available online at http://egov.oregon.gov/BOLI/WHD/PWR/Jul-2014.

30.2 Each Subcontract shall include the provisions of this section and wage rates applicable to the Work performed under the Subcontract.
31 ENVIRONMENTAL LAWS


31.2 Pursuant to ORS 279C.510, if the Contract contains a demolition component, the Contractor shall salvage or recycle construction and demolition debris if feasible and cost-effective.

31.3 Except as provided in Subsection 14.2 or in the Specifications, the Contractor shall use recycled Materials and provide recycled Goods, to the extent required by ORS 279A.125.

31.4 The Contractor must obtain the Contract Administrator’s consent prior to bringing any Hazardous Substances onto the Premises other than fuel, oil, and lubricants for construction equipment or Hazardous Substances required by the Specifications. The Contractor shall undertake any preventive and remedial actions that are required by Environmental Laws for any Hazardous Substances that are brought upon, used, kept, or stored on the Premises by the Contractor or Subcontractors.

31.5 The Contractor shall implement precautions required for Hazardous Chemicals by ORS 654.750 or OAR Chapter 340 & 437 that may be encountered or used at the Work Site. The Parties will exchange material safety data sheets, label information, and instructions for precautionary measures for any Hazardous Chemicals kept at the Work site by SHMC or used for the Work by the Contractor.

31.6 Both Parties shall comply with the requirements of ORS 279C.525. The Contractor shall immediately notify the Contract Administrator if:

31.6.1 The contractor is delayed or must undertake additional Work because of Environmental Laws of Governmental Agencies that are not named in the Contract Documents or Environmental Laws that are enacted after the Bid is submitted; or

31.6.2 The Contractor encounters a condition that requires compliance with Environmental Laws that is not described in the Specifications, that is not caused by the Contractor, and that was not discoverable by a reasonable visual pre-bid inspection of the Work Site.
31.7 Except for emergencies or as otherwise required by an Environmental Law, the Contractor shall stop Work affected by a condition that is subject to Subsection 31.6.2. Upon receipt of notice from the Contractor under Subsection 31.6, SHMC may take, or the Contract Administrator may direct the Contractor to take, any actions required or allowed by ORS 279C.525 or by other Environmental Laws.

31.8 If a release of a reportable quantity of Hazardous Substances occurs at the Work Site, the Contractor shall immediately notify the Contract Administrator and give any notices to Governmental Agencies that are required by Environmental Laws. The Contractor shall take measures necessary to prevent or mitigate significant harm to human health or the environment, as required or allowed by Environmental Laws. Notice to the Contract Administrator shall describe the nature, time, and location of the release; containment and cleanup procedures that have been implemented; contacts with Governmental Agencies and actions taken by Governmental Agencies; and injuries to persons or damage to property caused by the release.

31.9 Pursuant to ORS 279C.525(1), the following list identifies Governmental Agencies of which SHMC has knowledge that have enacted Environmental Laws which may affect the performance of the Work.

**FEDERAL AGENCIES**

Department of Agriculture
  - Forest Service
  - Soil Conservation Service
Department of Defense
  - U.S. Army Corps of Engineers
Department of Interior
  - Bureau of Land Management
  - Heritage, Conservation, and Recreation Service
  - Bureau of Indian Affairs
  - Office of Surface Mining, Reclamation, and Enforcement Geological Survey
U.S. Fish and Wildlife Service Department of Energy
  - Federal Energy Regulatory Commission
Environmental Protection Agency
Department of Health and Human Services
Department of Housing and Urban Development
Solar Energy and Energy Conservation Bank
Department of Labor
  - Occupation Safety and Health Administration
Department of Transportation
  - Federal Highway Administration
STATE AGENCIES

Department of Energy
Department of Agriculture
  Soil and Water Conservation
Division Department of Fish and Wildlife
Department of Forestry
Bureau of Labor and Industries
Water Resources Department
Department of Human Resources
Department of Consumer and Business Services
Department of Environmental Quality
State Advisory Committee on Historic Preservation
Land Conservation and Development Commission
Division of State Lands
Department of Geology and Mineral Industries

LOCAL AGENCIES

Board of County Commissioners
City Councils
Historical Preservation Commission
Planning Commissions
Fire Protection Districts
Water Supply Districts
Soil and Water Conservation Districts
Sanitary Districts
Water Authorities
Water Improvement District
Water Control Districts
Drainage Districts
Port Districts

31.10 Pursuant to ORS 279C.525(2), the Specifications and Documents provided by SHMC pursuant to Section 8 identify all known conditions at the Work Site that may require the Contractor to comply with Environmental Laws.

31.11 The Contractor shall bear all expenses for precautionary measures, mitigation, containment, and cleanup required by this section, except as otherwise provided by the Contract Documents or Applicable Laws.

31.12 Upon completion of the Work, the Contractor shall certify to the Contract Administrator that all abatement, clean-up, and disposal of Hazardous
Substances required by this section and Environmental Laws have been performed.

32 PATENTED OR COPYRIGHTED ITEMS

32.1 The Contractor warrants that SHMC’s use of any material, system, or other product for the Work will not infringe upon any patent, copyright, or any other proprietary right of any third party.

32.2 The Contractor shall provide to SHMC a nonexclusive, perpetual license to use computer software incorporated in the Work.

32.3 The Contractor shall pay all license fees, royalties, and other costs required by Applicable Laws or otherwise for use of any item that is subject to patent or copyright held by a third party.

33 WARRANTIES

33.1 Contractor warrants that the Work conforms to the Specifications.

33.2 All Goods that are provided by the Contractor in connection with the Work will be subject to the warranties provided by ORS 72.3120, 72.3130, 72.3140 and 72.3150.

33.3 Description of Materials and affirmations of qualities contained in documents submitted by the Contractor will constitute express warranties.

33.4 Standard warranties of manufacturers of Materials provided by the Contractor will apply to the extent that they enhance warranty protection for SHMC, but any provisions in manufacturer’s warranties that purport to limit the warranties will not affect the Contractor’s obligations under warranties stated in this section, the Specifications or other provisions of the Contract Documents.

34 RISK OF LOSS

34.1 Except as provided in Subsection 34.2, the Contractor will bear the risk of uninsured loss or damage to the Work which occurs prior to substantial completion of the Work.

34.2 SHMC will be responsible for a loss which occurs prior to substantial completion of the Work if such loss is caused solely by the acts or omissions of SHMC or its officers, agents, or employees.

34.3 After substantial completion of the Work, risk of uninsured loss or damage will be borne by SHMC, except loss or damage caused by the negligence or other wrongful acts or omissions of the Contractor, defects in the Work, or breach of warranty, which will be borne by the Contractor.

34.4 This subsection does not affect the obligations of the insurer under the policy provided pursuant to Section 40.
35 NO THIRD-PARTY BENEFICIARIES

35.1 The principals, employees, and agents of the Contractor and Subcontractors are not third-party beneficiaries of this Contract.

35.2 Notwithstanding Subsection 29.7, and ORS 279C.515, SHMC will not be obligated to pay any Subcontractor, Supplier, Employee of the Contractor, or any other person or entity who performs Work or provides Materials, unless SHMC elects to accept assignment of a Subcontract under Section 17.

36 LIABILITY OF SHMC’S OFFICERS, EMPLOYEES, AND AGENTS – Officers, employees, and agents of SHMC will not have any personal liability to the Contractor or the successors, principals, Subcontractors, Suppliers, insurers, or sureties of the Contractor for actions taken within the scope of their authority under the Contract Documents.

37 NO AGENCY – The Contractor, Subcontractors, Suppliers, and their principals, officers, employees and agents are not agents of SHMC as that term is used in ORS 30.265.

38 INDEMNIFICATION

38.1 Subject to Subsection 38.2, the Contractor shall defend and fully indemnify SHMC, the Port of Umpqua, Douglas County, and their officers, agents, and employees from Third-Party Claims resulting in whole or in part from:

38.1.1 The negligence or other torts of the Contractor or a Subcontractor;
38.1.2 Breach of the Contractor’s obligations under this Contract;
38.1.3 Any breach of any Subcontract or any contract between the Contractor and any third party concerning the Work;
38.1.4 Infringement of any interest described in Section 32 by Contractor or a Subcontractor;
38.1.5 Any violation of Applicable Law, including Environmental Laws, committed by the Contractor, a Subcontractor, or a Supplier;
38.1.6 Any other acts for which the Contractor is at fault.

38.2 Pursuant to ORS 30.140, the Contractor’s obligations and liabilities under Subsection 38.1 for Third-Party Claims arising out of death or bodily injury to persons or damage to property are limited to the extent that the Third-Party Claims arise out of the negligence or other fault of the Contractor, a Subcontractor, a Supplier, or the principals, officers, employees or agents of the Contractor, a Subcontractor, or a Supplier.
39 LIABILITY INSURANCE

39.1 The Contractor shall, at its own expense, at all times during the term of this Contract, maintain in force:

39.1.1 A commercial or comprehensive general liability insurance policy including coverage for completed operations and coverage for the Contractor’s obligations under Section 38 to the extent such obligations are insurable;

39.1.2 A comprehensive automobile liability insurance policy including owned and non-owned automobiles; and

39.1.3 An employer’s liability insurance policy.

39.2 The coverage under each policy must be equal to or greater than the limits for claims made under the Oregon Tort Claims Act (ORS 930.260 to 30.302) with minimum coverage as follows:

39.2.1 Commercial general liability limits of at least $1,000,000 combined single limit per occurrence and $2,000,000 in the aggregate.

39.2.2 Automobile liability limits of at least $1,000,000 combined single limit per accident.

39.2.3 Liability insurance must provide “occurrence” coverage. “Claims made” coverage will not be accepted. SHMC and SHMC’s officers, employees, and agents will be named as additional insureds on each policy.

40 PROPERTY INSURANCE

40.1 The Contractor, at its own expense, shall purchase and maintain builder’s risk property insurance covering the total value for the entire Work on a replacement cost basis without optional deductibles. The policy must insure against all risks of physical loss or damage to the Work from an external cause including, without limitation or duplication of coverage, physical loss or damage caused by fire, lightening, removal, theft, vandalism, malicious mischief, earth movement, collapse, water and windstorm. Coverage must include the interests of SHMC, the Contractor, Subcontractors, and Suppliers in the Work, including Materials stored at the Work Site, off the Work Site, or in transit. Coverage must be maintained until final payment is made or until SHMC has the sole insurable interest in the Work, whichever occurs later.

40.2 The Contractor will be responsible for payment of the amount of any deductible in the event of a paid claim.

40.3 All insured losses will be adjusted by SHMC and insurance proceeds will be paid to SHMC and disbursed by SHMC as fiduciary for the insureds, as their interests may appear.
If the Contractor maintains property insurance for the Contractor’s personal property, the insurer must execute a written waiver of subrogation against SHMC, which Contractor shall provide to the Contract Administrator.

41 GENERAL REQUIREMENTS FOR INSURANCE PROVIDED BY CONTRACTOR

41.1 Insurance that the Contractor is required to provide under the Contract Documents will be primary insurance for all claims and losses related to the Work.

41.2 Each policy provided by the Contractor must be issued by a responsible insurance company which is licensed to do business in the State of Oregon.

41.3 Prior to starting the Work, the Contractor shall provide certificates of insurance and endorsements for coverage required by this section, which will be subject to review and approval by the County Counsel. Each certificate must obligate the insurer to give written notice to SHMC thirty (30) days prior to termination or restriction of coverage and must name SHMC, the Port of Umpqua, Douglas County, and their officers, employees, and agents as additional insured. SHMC may reject a certificate which states that the insurer will merely “endeavor to mail” written notice.

41.4 In addition to the requirements of Subsection 41.3, above, the Contractor shall provide both verbal and written notice to SHMC immediately of any change in insurance coverage maintained by the Contractor while the Contractor is performing the Work under this Contract.

42 WORKERS’ COMPENSATION

42.1 The Contractor is a “subject employer” as defined in ORS 656.005 and shall comply with ORS 656.017. All persons performing Work at the Work Site must be covered by workers’ compensation insurance, regardless of whether they are “non-subject workers” described in ORS 656.027.

42.2 Before the pre-construction conference, the Contractor shall provide to the Contract Administrator a certificate of insurance for workers’ compensation coverage in a form acceptable to County Counsel or a certificate of self-insurance issued by ODBCA pursuant to ORS 656.430.

43 BONDS

43.1 Before the pre-construction conference the Contractor shall provide a performance bond and a labor and materials payment bond that conforms to ORS 279C.380, both of which must be issued by a responsible surety company licensed to do business in the State of Oregon. Each bond must be in a form approved by County Counsel and in an amount equal to the Contract Price.

43.2 In lieu of a surety bond, the Contractor may submit a cashier’s check or certified check in the amount equal to 100 percent of the Contract Price. SHMC will
negotiate the check and retain the moneys until the time limitation for claims against a bond expires or until all Third Party Claims against the moneys are resolved. SHMC will not pay the Contractor interest on the moneys.

43.3 Pursuant to ORS 279C.836, the Contractor shall, before starting work on the project, provide a public works bond to be filed with the Construction Contractor’s Board, unless exempt under ORS 279C.836(7) or (8).

44 PAYMENT

44.1 SHMC’s obligation to make payments under this Contract is conditioned upon appropriation of funds pursuant to the Oregon Local Budget Law. SHMC has appropriated funds for the Contract for fiscal year that ends on June 30 next following the date the Agreement is signed. If funds are not appropriated for Work performed in subsequent years, SHMC may terminate this Contract by notice to the Contractor.

44.2 The Schedule of Values must be consistent with the Contract Price Schedule and must divide Lump Sum Pay Items into parts that provide a reasonable basis for Progress Payments. An unbalanced Schedule of Values will be rejected. Within ten (10) days after receiving the proposed Schedule of Values, the Contract Administrator will either approve it or return it to the Contractor for revisions. The approved Schedule of Values will be part of the Contract Documents and will be amended to conform to changes in the Contract Price for Lump Sum PayItems.

44.3 Within ten (10) days after the end of each month, the Contractor shall submit to the Contract Administrator an Application for Payment in a form provided by SHMC together with documentation required by the Contract Documents or requested by the Contract Administrator. An Application for Payment must be consistent with the Contract Price Schedule and the approved Schedule of Values. If the Contractor is not a resident bidder, the Contractor shall submit proof of compliance ORS 279A.120(3) with the first Application for Payment.

44.4 SHMC will make monthly Progress Payments pursuant to ORS 279C.570 for Work that is completed or is in progress and for Materials that have been installed or are stored at the Work Site. By making a Progress Payments SHMC will not be deemed to accept defective Work or waiver of any breach of contract. The Contract Administrator will determine the amount of each Progress Payment based on:

44.4.1 The Contract Administrator’s estimate of the number of units of acceptable Unit Price Work performed by the Contractor and the Unit Prices stated in the Contract Price Schedule;

44.4.2 The Contract Administrator’s estimate of the percentage of Lump Sum items completed and the Schedule of Values;

44.4.3 Changes in the Contract Documents regarding measurement and payment that are made pursuant to Sections 24 and 25; and
44.4.4 Amounts that are withheld pursuant to this section.

44.5 Notwithstanding ORS 279C.555 or ORS 279C.570(7), SHMC shall retain 25% of any amount earned by Contractor on the public work until Contractor has filed certified statements of compliance with prevailing wage rate statues for the Contractor and all Subcontractors as required by ORS279C.845 or if the Contractor does not provide proof of compliance with ORS 279A.120(3) with the first Application for Payment.

44.6 SHMC may withhold from Progress Payments liquidated damages, the cost of correcting defective Work, and other damages and expenses for which the Contractor is responsible under the Contract Documents, subject to the provisions of the Contract Documents regarding Claims.

44.7 SHMC will withhold retainage equal to 5% of the value of completed Work pursuant to ORS 279C.550 to ORS 279C.570 until completion of all Work.

44.8 Final payment will be withheld until the Contractor submits to the Contract Administrator:

44.8.1 A written release of Claims in a form provided by the Contract Administrator which states that all Claims have been resolved, except for Claims pending under Section 48, Section 49, or Section 50 which are described in the release;

44.8.2 Written certification in a form provided by the Contract Administrator which states that all Subcontractors and Suppliers have been paid in full, that all obligations of the Contractor arising out of the Work have been satisfied, and that there are no liens of any kind outstanding against the Work;

44.8.3 Final As-Built Documents and other Documents required by Subsection 11.3;

44.8.4 Any records requested by the Contract Administrator to determine whether the Contractor’s certifications are accurate; and

44.8.5 Documents transferring title to the Work and any Goods provided by the Contractor to SHMC, free from any liens and encumbrances.

45 LIQUIDATED DAMAGES

45.1 If Substantial Completion is delayed beyond the expiration of the Contract Time, SHMC will suffer inconvenience and monetary damage, but ascertaining the actual loss sustained by SHMC may be difficult. In the absence of liquidated damages, SHMC may not have an adequate remedy if the Contractor delays Substantial Completion.

45.2 Contractor shall pay to SHMC any liquidated damages as stated in the Contract Documents for failure to complete the Work within the Contract Time. Notwithstanding any provision of this Contract that could be construed as conflicting with this Subsection 45.2, by submitting the Bid, the Contractor
waives any contention or Claim that the liquidated damages constitute a penalty.

45.3 If liquidated damages are not stated in the Contract Documents, or if SHMC elects to forgo recovery of liquidated damages by written notice to the Contractor, SHMC will be entitled to recover actual damages resulting from delays for which Contractor is responsible.

46 CONTRACT CLOSEOUT

46.1 The Contractor shall notify the Contract Administrator when the Contractor deems the entire Work ready for its intended use. Within five (5) Working Days thereafter, the Contractor and the Contract Administrator shall inspect the Work. If the Contract Administrator does not deem the Work to be substantially complete, the Contract Administrator will notify the Contractor of Work that must be executed to reach Substantial Completion. If the Contract Administrator deems the Work substantially complete, the Contract Administrator will notify the Contractor of the date of Substantial Completion and provide a Punch List of items to be completed or corrected before final payment.

46.2 When the Work specified in the Punch List is complete and all defects are corrected, the Contractor shall notify the Contract Administrator. Within five (5) Working Days after receiving such notice, the Contract Administrator will inspect the Work and take one or more of the following actions:

46.2.1 Recommend that SHMC accept the completed Work;
46.2.2 Direct the Contractor to complete Work; or
46.2.3 Take any action allowed by Section 22 for defective Work.

46.3 Upon completion of the Work, or sooner if requested by the Contract Administrator, the Contractor shall return all keys, parking passes, identification badges, and other personal property provided by SHMC to facilitate the Work and deliver all Documents described in Subsection 11.3 to the Contract Administrator.

46.4 Upon final completion of all Work and performance of all of the Contractor's obligations under the Contract Documents, SHMC will enter a written order accepting the Work.

47 LIMITATIONS ON CLAIMS

47.1 The Contractor cannot assert a Claim for damages or an increase in the Contract Price based on physical conditions at the Work Site or any form of “differing site conditions” unless:
47.1.1 The Claim is allowed by ORS 279C.525 or other Applicable Laws; or

47.1.2 The Claim is based on the negligence or other wrongful acts or omissions of SHMC, including material deficiency or inaccuracy of Documents provided by SHMC that could have been detected by SHMC with reasonable effort.

47.2 The Contractor may assert a Claim to obtain damages for a delay only if such damages are caused by an unreasonable delay that results directly and solely from the wrongful acts or omissions of SHMC. If SHMC must make a decision regarding the Work or the Contract Documents, any delay resulting from lack of a quorum or the requirements of the Oregon Public Meetings Law will be deemed reasonable, so long as SHMC endeavors in good faith to meet as soon as practicable.

47.3 The Contractor cannot assert a Claim based on breach of implied warranties of the Plans and Specifications unless the Contractor gives SHMC notice pursuant to Subsection 3.4.

47.4 The limitations in this section are in addition to other requirements for Claims under the Contract Documents.

48 PRELIMINARY CLAIMS RESOLUTION PROCESS

48.1 The Contractor must comply with this section if the Contractor contends that the Contractor is entitled to a change in the Contract Price, a change in the Contract Time, damages, or other relief under the Contract Documents because of any decision, act, or omission of SHMC or any officer, employee, or agent of SHMC. Notwithstanding Subsection 3.4, if the Contractor fails to comply with this section, the Claim will be deemed waived.

48.2 The Contractor must give notice of a Claim no later than ten (10) days after the occurrence on which the Claim is based and within thirty (30) days thereafter the Contractor shall submit a detailed statement of the Claim to the Contract Administrator which includes all facts on which the Claim is based, references to provision of the Contract Documents that are pertinent to the Claim, and the Contractor’s rationale for the Claim. If the Claim involves Work performed by Subcontractors, the Contractor’s shall provide the Contractor’s analysis and evaluation of the Subcontractor’s Claim.

48.3 Within thirty (30) days after the Contractor submits proper notice and a statement of a Claim, the Contract Administrator will review all information concerning the Claim and take one or more of the following actions:

48.3.1 Request additional information from the Contractor and suspend review of the Claim until such information is received;

48.3.2 Disallow the Claim by written notice to the Contractor; or
48.3.3 Prepare and execute a Change Order or issue a Work Change Directive changing the Contract Time or Contract Price or both.

48.4 If the Contract Administrator determines that SHMC is entitled to a change in the Contract Price or the Contract Time, damages, or any other relief under the Contract Documents, the Contract Administrator may submit written notice of a Claim to the Contractor within a reasonable time after the occurrence on which the Claim is based or within a reasonable time after the Contract Administrator discovers such occurrence. Within thirty (30) days after the Contractor receives notice of SHMC’s Claim, the Contractor shall submit a written reply providing any information requested by the Contract Administrator. Within thirty (30) days of receipt of the Contractor's reply, the Contract Administrator will take appropriate action under Subsection 48.3 and give the Contractor notice of such action. This subsection does not limit SHMC's right and powers to take unilateral action under other provisions of the Contract Documents.

48.5 Pending final resolution of a Claim, unless the Work is suspended under Section 27 the Contractor shall continue diligent prosecution of the Work.

49 MEDIATION

49.1 A decision of the Contract Administrator under Section 48 will be final and binding on the Contractor, unless the Contractor submits a request for mediation within ten (10) days after the Contract Administrator issues a written decision to the Contractor. SHMC may request mediation on any Claim of SHMC that is not resolved under Section 48.

49.2 A request for mediation shall be submitted in the same manner as notices under Section 6. Both Parties are obligated to participate in mediation before proceeding with litigation. Within ten (10) days after a timely request for mediation is made, representatives of the Parties will meet to select a mediator, and if they are unable to agree on a mediator within ten (10) days thereafter, either Party may petition the Circuit Court for Douglas County to appoint a mediator.

49.3 Procedures for mediation will be determined by the mediator. Each Party will pay its own costs for mediation, including attorney's fees. The cost of the mediator's services will be shared equally by the Parties. Both Parties shall endeavor in good faith to resolve all Claims in mediation.

50 LITIGATION

50.1 If a breach of contract occurs, and the resulting Claim is not resolved through mediation within thirty (30) days after the mediation process begins under Section 49, or if either Party refuses to participate in mediation, the Party injured by the breach may pursue any equitable or legal remedies available
under Oregon Law. The enforcement of one remedy by a Party will not impair any other right or remedy.

50.2 Litigation arising out of this Contract will be conducted in Circuit Court of the State of Oregon for Douglas County.

51 TERMINATION FOR CONVENIENCE – In addition to SHMC’s right to terminate under Subsection 44.1 or Section 50 or under Applicable Laws, SHMC may terminate the Contract in whole or in part if SHMC determines that termination of the Contract is in the best interest of the public. SHMC will endeavor to give the Contractor written notice thirty (30) days prior to the date of termination under this section, but failure to give such notice will not invalidate SHMC’s action.

52 ACTION UPON TERMINATION

52.1 Unless the Contract Administrator directs otherwise, upon receiving notice of termination, the Contractor shall stop the Work, terminate Subcontracts, stop orders for Materials, and surrender the Work Site to SHMC. The Contractor shall deliver to the Contract Administrator all Documents concerning the Work and property that the Contractor would be required to furnish upon Contract closeout. The Contract Administrator may direct the Contractor to take actions to preserve and protect completed Work and to leave Materials at the Work Site.

52.2 If SHMC terminates under Subsection 44.1 or Section 51 and the Contractor is not in default, SHMC will pay the Contractor for Work that is completed prior to termination, Work directed pursuant to Subsection 52.1, Materials that the Contractor is directed to leave at the Work Site, and reasonable expenses directly resulting from termination. If mobilization is not a Pay Item, the Contractor may request payment for actual mobilization costs that were allocated to terminated Work. The Contractor will not be entitled to payment for lost profits for any Work that is not performed prior to termination.

END OF SECTION
PART 1 GENERAL

1.01 SUMMARY
A. This Section specifies administrative and procedural requirements for handling and processing the following Contract modifications:
   1. Salmon Harbor Management Committee’s Supplemental Instructions, (ASI).
B. Related Documents and Sections:
   1. General Conditions.
   2. Section 01-3000: Product Substitution Procedures, for administrative procedures for handling request for substitutions made after Contract award.
   3. Section 01-7000: Closeout Procedures, for requirements for inclusion of contract modifications in record documents.

1.02 RESPONSIBLE PARTIES
A. Immediately following Contract execution, Salmon Harbor Management Committee and Contractor to identify each person who is responsible for executing Change Orders and other modifications to the Contract.

1.03 DEFINITIONS
A. Request for Information (RFI):
   1. Written request submitted by Contractor to Salmon Harbor Management Committee on standard form requesting interpretation of Contract documents.
   2. An RFI shall only be used as a vehicle for confirming or verifying an issue through an interpretation of the Contract Documents; responses that result in change to Contract Documents and adjustment to Contract Sum and/or Contract Time must be documented in a Change Order.
B. Owner’s Supplemental Instructions/Architects Supplemental Instructions (ASI):
   1. SHMC’s written order of instruction to Contractor, signed by SHMC, that authorizes minor changes in Work that do not change Contract Sum or Contract Time.
C. Proposal Request (PR):
   1. Initiated by SHMC/Architect: Written request by SHMC to Contractor to quote change to Contract Sum and/or Contract Time for proposed change to Contract Documents.
   2. Initiated by Contractor: Written request by Contractor to SHMC proposing change to Contract Documents accompanied with quotation for change to Contract Sum and/or Contract Time.
D. Change Order (CO):
   1. Prepared by SHMC/Architect, signed by Contractor, Architect and SHMC stating their agreement to a change to the Contract Documents and adjustment to Contract Sum and/or Contract Time.

1.04 REQUEST FOR INFORMATION (RFI):
A. Submit RFI’s numbered in sequential order, reviewed by Contractor with respect to construction documents, with the following information:
1. Project name and address.
2. Contractors name.
3. Date of RFI.
5. Signature of Contractor's reviewer.
6. Indicate “URGENT” on RFI's that may cause impact to the project schedule.

B. SHMC will receive RFI's only from the Contractor; SHMC will not accept RFI's directly from subcontractors, suppliers, or other entities.

C. SHMC will receive only legible, properly prepared RFI's.
   1. Unreadable facsimile machine RFI's, illegibly written RFI's, or RFI's with incomplete information, will be returned promptly without action.
   2. RFI's may be transmitted to SHMC by facsimile machine OR Email using PDF.
      a. SHMC will return response by same method received from Contractor.
      b. SHMC will review RFI's with respect to Contract Documents and return response within 7 calendar days.
         1) RFI's marked “URGENT” will take precedence, in order received, over outstanding RFI's and be answered by SHMC as soon as possible.

D. Contractor, in being fully familiar with Construction Documents, shall not be relieved of responsibility to coordinate the Work to prevent adverse impact to Project schedule when submitting RFI's to SHMC for interpretation of Contract Documents.

1.05 OWNER'S (ARCHITECT) SUPPLEMENTAL INSTRUCTIONS (ASI)

A. Supplemental Instructions may include supplementary or revised Drawings and/or Specifications to describe minor changes to Contract Documents.

B. Supplemental Instructions will be executed on a Form provided by SHMC and as attached to these specifications.

1.06 PROPOSAL REQUEST (PR)

A. Proposal Request Initiated by Salmon Harbor Management Committee/Architect:
   1. Proposal Request is a request for information only, and is not an instruction or authorization to execute the change, or an order to stop Work in progress.
   2. Proposal Request may include supplementary or revised Drawings and/or Specifications to describe a proposed change to Contract Documents.
   3. Contractor shall submit cost and/or time quotations to SHMC within 10 working days following receipt of Proposal Request.

B. Proposal Request Initiated by Contractor (Contractor Change Request):
   1. Proposal Request is for a change in the Work accompanied by a detailed quotation of impact on Contract Sum and/or Contract Time.
   2. Proposal Request may include revised Drawings and/or Specifications to describe a proposed change to Contract Documents.
   3. Proposal Request is a request for information only, and does not authorize the Contractor to execute the change or stop work in progress without SHMC's authorization.
   4. Contractor initiated Proposal Requests may take the form of a “Claim” where Contractor finds it necessary for proper execution of the Work, to propose a change in the Work that is not shown or indicated in Contract Documents, and may affect Contract Sum and/or Contract Time, for which no Proposal Request or Construction Change Authorization has been issued by SHMC.
a. Contractor’s determination that SHMC’s response to an RFI which affects Contract Sum and/or Contract Time may be addressed in a Proposal Request.

5. SHMC shall respond to Contractor initiated proposals within 10 working days following receipt of Proposal Request.

1.07 CHANGE ORDERS

A. SHMC/Architect will prepare each Change Order utilizing a suitable form.

B. Changes to Project Contract Sum and/or Contract Time listed or indicated in Change Orders shall include or be determined by methods described in the General Conditions, and as follows:
   1. Proposal Requests approved for change to Contract Documents by SHMC that have not been converted to a Construction Change Directive.
   2. Construction Change Directives where SHMC and Contractor have agreed to change in Project Contract Sum and/or Contract Time.
   3. Changes to Project Contract Sum and/or Contract Time that have not been documented by Proposal Request or Construction Change Directive, but have been agreed upon by SHMC and Contractor.

1.08 DOCUMENTATION FOR CONTRACT MODIFICATIONS

A. Cost and Time Quotations: Support quotation for changes in the Work with sufficient substantiating data to allow SHMC to evaluate quotation, to include the following:
   1. Labor expended in hours and unit cost.
   2. Equipment cost.
   3. Products, with quantities used and unit cost, including purchase source.
   4. Taxes, Insurance, and Bonds.
   5. Credit for deleted work where applicable with same documentation as required for cost increases for additional work.
   6. Overhead and profit, determined after credits have been deducted from additions.

B. For claims for Work not authorized through Proposal Requests or Construction Change Directives, provide supporting documentation for each claim for additional cost as indicated above for cost and time quotations with the following additional information:
   1. Name of SHMC’s authorized agent who ordered work, and date of Order.
   2. Dates and hours work performed, and by whom.
   3. Timecard records, including summary of hours worked, and hourly rates paid.
   4. Receipts and invoices for products used including quantities and unit costs.
   5. Receipts and invoices for equipment utilized, including dates and time of use.
   6. Provide the same documentation indicated above for subcontracts same as required for Contractor’s own forces.

C. Document requests for Product substitutions according to requirements of Section 01630.

1.09 CORRELATING CHANGE ORDERS WITH OTHER REQUIREMENTS

A. Revise Schedule of Values and Applications for Payment to record each Change Order as separate item of work with adjustment to Contract Sum and Contract Time as described in Section 44 of the General Conditions for Construction Contracts: Payment.

B. Revise Construction Schedule to reflect each change in Contract Time.

C. Revise Sub schedules to show changes for other items of work affected by modifications to Contract Documents.

D. Record modifications in Record Documents.
PART 2 PRODUCTS

2.01 FORMS - ATTACHED FOLLOWING THIS SECTION:

A. Change Order
B. Architects Supplemental Instructions
C. Proposal Request

PART 3 EXECUTION - NOT USED

END OF SECTION
CHANGE ORDER

PROJECT: Salmon Harbor Marina
RV Resort Expansion - SITE WORK

CHANGE ORDER NUMBER: One (1)

DATE: 
PROJECT NO.:

CONTRACT DATE: 

TO: 

You are directed to make the following changes in this Contract:

Not valid until signed by the Owner, Architect, and Contractor.

The original Contract Sum was

Net Change by previously authorized Change Orders $ -

The Contract Sum prior to this Change Order was $ -

The Contract Sum will be changed by this Change Order in the amount of $ -

The new Contract Sum including this Change Order will be $ -

The Contract Time will be

The Date of Completion as of the date of this Change Order therefore is

Architect: HGE INC., Architects, Engineers & Planners
333 South 4th Street
Coos Bay, Oregon 97420

Contractor: 

Owner:
Salmon Harbor Management Committee
P.O. Box 1007 / 100 Ork Road
Winchester Bay, Oregon 97467

By: __________________ By: __________________ By: __________________

Date: ______________ Date: ______________ Date: ______________
ARCHITECT’S
PROPOSAL REQUEST #1

PROPOSAL REQUEST NO.: ONE (1)
DATE OF ISSUANCE: PROJECT NO.: 15.68

TO:

PROJECT:
Salmon Harbor Marina RV
Site Work

CONTRACT FOR:
Salmon Harbor Marina RV Expansion

ARCHITECT:
HGE INC.
333 South 4th Street
Coos Bay, Oregon 97420

OWNER:
Salmon Harbor Management Committee
PO Box 1007 / 100 Ork Rock Road,
Winchester Bay, Oregon 97467

Please submit an itemized quotation for changes in the contract sum and/or time incidental to proposed modifications to the Contract Documents described herein.

THIS IS NOT A CHANGE ORDER NOR A DIRECTION TO PROCEED WITH THE WORK DESCRIBED HEREIN.

DESCRIPTION:

1.

ATTACHMENTS:

Add: $ ____________________

Signed: ____________________

Date: ____________________

REQUESTED BY: Joe Slack, Architect, AIA
HGE Inc., Architects, Engineers & Planners
333 S. 4th Street, Coos Bay, Oregon 97420

DISTRIBUTION:
(VIA EMAIL)
### ARCHITECT’S SUPPLEMENTAL INSTRUCTION #1

**PROJECT:** Salmon Harbor Marina RV Expansion – Site Work  
**PROJECT NO.:** 15.68  
**OWNER:** Salmon Harbor Management Committee  
PO Box 1007 / 100 Ork Rock Road  
Winchester Bay, Oregon 97467  
**DATE OF ISSUANCE:**  
**CONTRACT DATE:** To Be Determined  
**TO CONTRACTOR:** To Be Determined

The work shall be carried out in accordance with the following supplemental instructions issued in accordance with the Contract Documents without change in Contract Sum or Contract Time. Proceeding with the work in accordance with these instructions indicates your acknowledgment that there will be no change in the Contract Sum or Contract Time.

### DESCRIPTION:

1. 

### ATTACHMENTS:

**ISSUED BY:** Joe Slack, Architect, AIA  
HGE Inc., Architects, Engineers & Planners  
333 S. 4th Street, Coos Bay, Oregon 97420

**DISTRIBUTION:**  
(via email)
GEOTECHNICAL STUDY AND REPORT
SALMON HARBOR MARINA
R.V. EXPANSION
WINCHESTER BAY, OREGON

Pinnacle Engineering, Inc.

Matt Keller, PE, CSI
Project Engineer
President

Project #30068.03
20 August 2018
INDEX

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover</td>
<td>i</td>
</tr>
<tr>
<td>Index</td>
<td>ii, iii, iv</td>
</tr>
<tr>
<td>A. EXECUTIVE SUMMARY</td>
<td>1</td>
</tr>
<tr>
<td>B. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>B.1. Purpose and Scope</td>
<td>1</td>
</tr>
<tr>
<td>B.2. Site and Project Description</td>
<td>1</td>
</tr>
<tr>
<td>C. TOPOGRAPHIC MAPPING</td>
<td>2</td>
</tr>
<tr>
<td>D. GEOLOGIC SITE CHARACTERIZATION</td>
<td>2</td>
</tr>
<tr>
<td>D.1. Regional Geology</td>
<td>2</td>
</tr>
<tr>
<td>D.2. Project Area Geology</td>
<td>2</td>
</tr>
<tr>
<td>D.3. Seismicity and Seismotectonic Considerations</td>
<td>3</td>
</tr>
<tr>
<td>D.3.a. Area and Site Seismicity</td>
<td>3</td>
</tr>
<tr>
<td>D.3.b. Site Stability</td>
<td>4</td>
</tr>
<tr>
<td>D.3.c. Site Classification</td>
<td>4</td>
</tr>
<tr>
<td>D.3.d. Seismic Refraction Survey</td>
<td>4</td>
</tr>
<tr>
<td>E. FIELD STUDIES</td>
<td>4</td>
</tr>
<tr>
<td>E.1. Surface Reconnaissance</td>
<td>4</td>
</tr>
<tr>
<td>E.2. Surface Hydrology</td>
<td>4</td>
</tr>
<tr>
<td>E.3. Field Observations</td>
<td>5</td>
</tr>
<tr>
<td>E.4. Site Exploration and Field Testing</td>
<td>5</td>
</tr>
<tr>
<td>E.5. Geotechnical Characterization</td>
<td>6</td>
</tr>
<tr>
<td>E.6. Groundwater</td>
<td>6</td>
</tr>
<tr>
<td>E.7. Subsurface Soil Conditions</td>
<td>6</td>
</tr>
<tr>
<td>E.8. Soil Permeability</td>
<td>7</td>
</tr>
<tr>
<td>F. LABORATORY TESTING</td>
<td>7</td>
</tr>
<tr>
<td>F.1. Soil Classification</td>
<td>7</td>
</tr>
<tr>
<td>F.2. Electro-Chemical Parameters</td>
<td>7</td>
</tr>
<tr>
<td>F.3. Strength Parameters</td>
<td>7</td>
</tr>
<tr>
<td>F.4. Performance Parameters</td>
<td>8</td>
</tr>
<tr>
<td>G. ENGINEERING STUDIES AND RECOMMENDATIONS</td>
<td>8</td>
</tr>
<tr>
<td>G.1. General</td>
<td>8</td>
</tr>
<tr>
<td>G.2. Site Preparations and Grading</td>
<td>8</td>
</tr>
<tr>
<td>G.2.a. Clearing, Grubbing and Stripping</td>
<td>8</td>
</tr>
<tr>
<td>G.2.b. Removal of Unsuitable Soil</td>
<td>9</td>
</tr>
<tr>
<td>G.2.c. Density Testing and Subgrade Recompaction</td>
<td>9</td>
</tr>
<tr>
<td>G.3. Structural Fill Placement and Compaction</td>
<td>9</td>
</tr>
<tr>
<td>G.3.a. Structural Fill Materials</td>
<td>9</td>
</tr>
<tr>
<td>G.3.b. Structural Fill Placement</td>
<td>10</td>
</tr>
<tr>
<td>G.3.c. Compaction</td>
<td>10</td>
</tr>
<tr>
<td>G.3.c1. Fill Observation and Testing Methods</td>
<td>10</td>
</tr>
<tr>
<td>G.3.d. Structural Fill Volume</td>
<td>10</td>
</tr>
<tr>
<td>G.3.e. Non-Structural Fill</td>
<td>10</td>
</tr>
<tr>
<td>G.4. Slopes</td>
<td>10</td>
</tr>
<tr>
<td>G.4.a. Cut Slopes</td>
<td>11</td>
</tr>
<tr>
<td>G.4.b. Fill Slopes</td>
<td>11</td>
</tr>
<tr>
<td>G.5. Pavement Analysis and Design</td>
<td>11</td>
</tr>
</tbody>
</table>

Pinnacle Engineering, Inc.
Email: matt@pinnacleengineeringinc.com
3329 NE Stephens St.
Roseburg, OR 97470
Phone (541) 440-4871
Fax (541) 672-0677
Project # 30068.03

Page ii of 20
G.5.a. Traffic Projections ................................................................................. 11
G.5.b. Low Strength Natural CLAY Soil .......................................................... 11
G.5.c. Concrete Pavement ............................................................................... 11
G.5.d. Non-Structural Slabs on Grade ............................................................ 12

G.6. Site Drainage and Erosion Control .......................................................... 12
G.6.a. Buildings ................................................................................................ 12
G.6.b. Surface Areas ......................................................................................... 12
G.6.c. Erosion Control ...................................................................................... 12

G.7. Building Foundations ................................................................................ 12
G.7.a. General ................................................................................................... 12
G.7.b. Imported Fill Soil ................................................................................... 12
  G.7.b.1. Subgrade Preparation ...................................................................... 12
  G.7.b.2. Structural Fill .................................................................................... 13
  G.7.b.3. Fill Placement .................................................................................. 13
  G.7.b.4. Unsuitable Soil .............................................................................. 13
  G.7.b.5. Footing Embedment ...................................................................... 13
  G.7.b.6. Allowable Bearing Pressure ......................................................... 13
    G.7.b.6a Increases ..................................................................................... 13
  G.7.b.7. Minimum Width ............................................................................ 13
G.7.c. Footing Drains ....................................................................................... 14
G.7.d. Settlement ............................................................................................. 14
G.7.e. Interior Floor Slabs .............................................................................. 14
  G.7.e.1. Aggregate Base Course .................................................................. 14
  G.7.e.2. Underslab Membrane .................................................................. 14
  G.7.e.3. Minimum Slab Thickness .............................................................. 14
  G.7.e.4. Isolation ........................................................................................ 14
  G.7.e.5. Reinforcement .............................................................................. 14
  G.7.e.6. Reinforcement Location ............................................................... 15
  G.7.e.7. Fiber ............................................................................................. 15
  G.7.e.8. Joints ............................................................................................ 15
G.7.f. Footing and Floor Drains ...................................................................... 15
  G.7.f.1. Footing Drains ................................................................................ 15
  G.7.f.2. Wall Drains .................................................................................... 15
  G.7.f.3. Floor Subdrains ............................................................................. 15
  G.7.f.4. Discharge ...................................................................................... 15
G.8. Lateral Earth Pressures and Drainage ....................................................... 15
G.8.a. Lateral Load Resistance ...................................................................... 15
G.8.b. Lateral Earth Pressures ........................................................................ 16

G.9. Trenching and Piping ........................................................................... 17

H. ADDITIONAL SERVICES AND LIMITATIONS OF REPORT ......................... 17
H.1. Additional Services ................................................................................ 17
H.2. Limitations ............................................................................................. 18
FIGURES

Figure 1 ..................................................................................................................... Vicinity Map
Figure 2 ........................................................................................................................... Site Map
Figure 3 ........................................................................................................ Geologic Reference
Figure 4 .................................................................................................................. Geologic Map
Figure 5A ..................................................................................................... Geosynthetic Notes
Figure 5B ...................................................................................................... Geosynthetic Table

APPENDICES

Appendix A ............................................................................... Test Pit/Boring Logs and Tests
GEOTECHNICAL STUDY AND REPORT
SALMON HARBOR MARINA, RV EXPANSION
WINCHESTER BAY, OREGON

A. EXECUTIVE SUMMARY

It is our opinion, supported by field investigations, laboratory tests and geotechnical analysis, that the existing and proposed site work, soils and geological conditions at the project site are suitable for the proposed building, provided the recommendations of our report are incorporated during design and construction.

Special attention will be required during site preparation, construction of the building foundations and drainage features and other associated improvements. Subsequent sections of this report provide geotechnical recommendations for design and construction of the planned project.

- Local deposits of unsuitable soils may be encountered and would require excavation and disposal.
- Construction Materials Engineering and Testing (CoMET) services of site cuts and fills, compaction testing and observation of construction of slopes and drainage features is recommended.
- CoMET of structural fill and MSE or other retaining walls is required.
- Review of site and foundation design by the geotechnical engineer is recommended prior to beginning construction.

The following sections of this report provide geotechnical recommendations for design and construction of the planned project.

B. INTRODUCTION

B.1. Purpose and Scope

The Salmon Harbor Marina, seeking to expand upon its successful RV Park located on the west spit, has decided to construct an additional 40 recreational vehicle camp sites, associated parking and recreational facilities, pave additional access roads, a laundry/restroom facility and a number of small, ancillary sign and kiosk structures. This report presents the results of field exploration, laboratory tests and geotechnical recommendations for foundation design.

Field investigations consisted of three drill advanced borings, two backhoe test pits, and a geotechnical reconnaissance of the site. Soil samples were retrieved from the borings for laboratory testing and further studies necessary to formulate recommendations for design of the components of the proposed facility, to evaluate potential complications that may occur during construction and to assess long term performance of foundation(s) and paved areas.

B.2. Site and Project Description

The Marina RV Resort site is located in the, Township 22S, Range 13W, W.M., on the west spit. It is bounded on the west and north side by the main channel of the Umpqua
River, on the south side by Salmon Harbor Drive, and on the east side by the harbor facility.

The location investigated is approximately 600 feet by 600 feet in plan and slopes generally south away from the main channel. A vicinity map depicting the site and general surrounding area is presented as Figure 1. Preliminary layout of the improvements is shown on Figure 2, as are test boring and test pit locations.

For the purposes of this analysis, maximum foundation loads were assumed to be from bearing walls, and to be less than 1 kip/lf in magnitude. Structure type was assumed to be light frame, with masonry bearing walls a possible alternate.

Pertinent geotechnical factors that may influence design and construction include:

- An irregular shaped deposit of highly organic dredge spoils undefined in plan and of varying depth throughout the study area and
- Stability of excavations during construction of all utility trenches and/or deep foundations.

If excavation deeper than about eight feet is required, subsurface water will likely be of concern. In order to construct excavations near the free water elevation, dewatering will be necessary. If dewatering is required, well points are recommended as the most suitable process, however other dewatering methods may also prove satisfactory.

Stability of excavations will be of normal concern during construction, as the overburden soils are predominantly granular and nearly cohesionless. Shoring or benching will be required for all excavations deeper than four feet. Excavation into or through the organic component of dredge spoils, more fully discussed below, will likely require shoring nearer the surface, as the material exhibits little shear strength and can flow plastically under normal conditions and without load.

Site soils are non expansive.

C. TOPOGRAPHIC MAPPING

Topographic surveys were not conducted for this effort.

D. GEOLOGIC SITE CHARACTERIZATION

Geologic and geotechnical terms used in this report are defined in Figure 3. Surface geologic mapping of the site is presented as Figure 4.

D.1 Regional Geology

The project site is located approximately 50 miles east of the Cascadia Subduction Zone. The Cascadia Subduction Zone reflects subduction of the Juan de Fuca plate beneath the western edge of the North American continental shelf. ¹

D.2 Project Area Geology

The site soils consist of a man made layer of dredge spoils placed in geologic recent time over existing Quaternary Alluvium, in turn underlain by the Tyee-Elkton formation.

**Quaternary Alluvium (Qal)** – Alluvial deposits cover the valley floors of parts of many of the major streams in the Coast Range Province. Major deposits of Quaternary alluvium include those along the Umpqua, North Umpqua and South Umpqua Rivers in the Roseburg and Elkton areas. The flat bottom lands represent local flood plain deposits which were formed as the stream established a series of local base levels while cutting through barriers in the more resistant parts of the Coast Range to the west. The alluvium is composed of silts and pebbly sands with lenses of gravel in places. At present, most of the streams are dissecting the alluvial fill. Locally, terraces are preserved along the sides of the valleys as at Reedsport. The flat land is valuable and in places may contain economic deposits of sand and gravel.

**Tyee-Elkton Formation (Tet)** - The Tyee Formation was described and defined by Diller (1898) in the Roseburg Quadrangle. Baldwin (1961) assigned the finer-grained siltstones which comprise the upper parts of the section to the Elkton siltstone member (Tee) of the Tyee Formation. Subsequently Thoms (1965) and Bird (1967) proposed elevating the unit to formational status in their respective theses. Lovell (1969) treats the unit as a formation. To date, however, no formal definition of the Elkton siltstone as a formation has been forthcoming.


D.3. Seismicity and Seismotectonic Considerations

Local faults generally trend from north to south, and include both normal and thrust type events. Inactive fault locations relative to the project site are depicted on Figure 4.

D.3.a. Area and Site Seismicity

Extensive seismotectonic studies have concluded that western Oregon is subject to a much greater likelihood of both random and plate-subduction seismic events of far greater magnitude and far more frequently than was formerly believed. The area west of the Coast Range falls within Seismic Zone 4 for Uniform Building Code purposes, requiring a Seismic Zone Factor of 0.4 for design.

The site is located within 100 miles of an accretionary wedge associate with subduction of the *Juan de Fuca* plate and is between five and thirty miles of the Heceta South Fault and the Coos Basin Fault. Maximum credible magnitude distributions for the faults are estimated to be in the range of 6.5 to 7.

The design spectral response acceleration expected in the project area is as follows;

\[
\begin{align*}
S_S &= 1.333 \, g \\
S_{MS} &= 1.333 \, g \\
S_{DS} &= 0.889 \, g \\
S_I &= 0.694 \, g \\
S_{M1} &= 1.042 \, g \\
S_{D1} &= 0.694 \, g
\end{align*}
\]
D.3.b. Site Stability

The test borings indicate that, beneath a very thin vegetative mantle, the area is underlain by very loose to loose sands. Although a seismic refraction survey was not within the scope of services, experience indicates that the sand can be expected to transmit lateral accelerations representative of a velocity range of less than 600 feet per second.

The soils underlying the project site are likely to be very stable during seismic events having a reasonable probability of occurrence. There is no likelihood of damaging liquefaction under the loads proposed.

D.3.c. Site Classification

Beneath the area is generally underlain by a surface layer of SAND over a layer of sandy CLAY. Soils underlying the site are consistent with Site Class D, as defined by current Oregon Structural Specialty Code (OSSC).

D.3.d. Seismic Refraction Survey

A seismic refraction survey was neither requested by our client nor conducted for this investigation. Qualitatively;

- The near surface soils are underlain at shallow depth by low plasticity sandy SILT, which can be expected to transmit lateral accelerations typical of a lower velocity range of 400 to 600 ft/sec.
- Underlying the high plasticity clayey SILT material, the SAND material can be expected to transmit lateral accelerations typical of a lower velocity range of 400 to 600 ft/sec.
- Underlying the SAND material, the low plasticity sandy CLAY material can be expected to transmit lateral accelerations typical of a lower velocity range of 400 to 600 ft/sec.

E. FIELD STUDIES

E.1. Surface Reconnaissance

In conjunction with the geologic and geotechnical site characterization, a surface reconnaissance was conducted at and adjacent to the project site. The surface reconnaissance concluded that there were no observable site defects that would compromise viability of the site for its intended purpose.

The reconnaissance determined that the site, although prone to both flooding and impact in the event of tsunami, is stable.

E.2. Surface Hydrology

The shallow natural CLAY and SILT layers are relatively impermeable and, therefore, retard percolation of surface water. Although retarded, the surface water typically penetrates through fractures in the rock, which results in retention of much of the
seepage close to the surface. The underlying CLAY and SILT interface appears to transmit a small to moderate amount of water year round, increasing during wet months.

Post development, the surface water runoff will be conveyed via gutters, ditches and storm drains then, ultimately, the Umpqua River.

E.3. Field Observations

Field observations included soil description, classification, qualitative density measurement, thickness measurement of the various soil horizons and depth to or presence of groundwater.

E.4. Site Exploration and Field Testing

Three borings, designated TB1 through TB3, were drilled at the locations shown on Figure 2. All borings were drilled by Western Testing, LLC (WTL) using a truck-mounted Back Country Badger drill rig which advanced 6" diameter continuous flight hollow stem auger to a depth of approximately twelve feet. The drilling and sampling operations were performed and the drill holes logged by a Certified Soils Technician, under the supervision of a registered Professional Engineer.

Soils retrieved from auger cuttings were continuously classified during drilling by our Technician.

Samples were taken in each boring, at approximate 4 foot intervals and at soil horizon changes apparent from drill cuttings. Most of the samples were obtained using a split spoon advanced by the Standard Penetration Test Method, which also provides an accurate measure of soil density. The Standard Penetration Test measures the resistance to penetration of a 2" diameter sampler driven by a 30" drop of a 140 pound hammer and provides a disturbed, but representative sample suitable for classification and other testing.

Undisturbed samples of cohesive materials were taken by advancing thin wall tubes at the locations and depths noted on the drill logs. Samples were recovered from the thin wall tubes and tested to determine plasticity index, natural moisture/density relationship and other benchmark tests. Finally, bulk samples were taken at the depths and locations indicated on the drill logs for other laboratory tests.

The drill holes were filled with cuttings immediately upon completion of drilling. Bentonite seals were not required.

The summary logs of test borings are contained in Appendix A. Please note that soil descriptions and horizons shown in field logs are distinctive. Actual changes in soil horizons are gradual. Water levels are for the dates of observation and are likely to vary seasonally.

Field testing included the Standard Penetration Tests described above. Additional representative soil samples were obtained for laboratory analysis to determine classification, natural moisture and density, plasticity index, coarse particle specific gravity, coarse particle distribution, consolidation characteristics of the fine grained portions and moisture density relationship.
Two test pits, TP1 and TP2 were advanced to twelve feet using a CAT 420D Back Hoe with a 20” bucket. Test pit locations were selected by the geotechnical engineer and are depicted on Figure 2. The excavations were observed, logged and samples retrieved by a certified technician. The summary logs of test pits are contained in Appendix A.

Samples were retrieved in each test pit at visible soil horizon changes. Most of the samples were obtained using a Modified California Barrel advanced by hand driving, which provides a measure of soil density while recovering moderately disturbed samples for strength and performance testing. Bulk samples were retrieved at the depths and locations indicated on the test pit logs.

In addition to basic field soil classification tests, in situ field density tests were conducted on natural site soils.

The test pits were left unfilled for a brief time to allow groundwater levels to stabilize if present. Groundwater was not encountered at any of the test pit locations.

Please note that shear strengths and estimated bearing capacities noted on the field logs are field estimates of ultimate values, recorded for correlation of laboratory results and are only provided for comparative purposes. They should not be used for design. We should be contacted before utilization of values other than those recommended in Section G to confirm applicability and that the designer’s interpretation is consistent with our understanding of design properties.

E.5. Geotechnical Characterization

The site soils average more than 14 feet in depth at the site, and are likely to be consistent within the influence area and depth of each foundation. Shallow soils are generally very loose to loose sands with a silt component. The shallow soils are compactible, after removal of the vegetative component, and may be used as site fills. The vegetative component is suitable for use as landscaping material.

E.6. Groundwater

Groundwater (the phreatic surface) was observed in test borings 1 and 2 at depths of 12 feet and 8 feet respectively. Groundwater was not clearly identified during exploration due to caving of the drill holes, however is likely to closely reflect water surface elevations of the harbor. We project that the average high groundwater elevation will be approximately 10 feet below the finished surface.

E.7. Subsurface Soil Conditions

The surface layer along the north margin of the site consists of a thin layer of sandy SILT approximately five feet thick. Underlying the sandy SILT is a layer of SAND approximately four feet thick which transitions to a layer of sandy CLAY at a depth of approximately eight feet.

The surface layer along the south margin of the site consists of a layer of sand that transitions to a layer of sandy CLAY at an approximate depth of eight feet.
E.8. Soil Permeability

Permeability tests were not performed for this study. Qualitatively, flow velocities within the proposed structural fill soil can be expected to range between $10^{-4}$ and $10^{-5}$ cm/sec and as high as $10^{-2}$ cm/sec at the bedrock interface where fine grained soils transition to weathered formational material. Where sandy layers exist, their permeability will be on the order of $10^{-3}$ cm/sec.

F. LABORATORY TESTING

All of the samples recovered during the site exploration were visually reexamined at our Roseburg laboratory to verify the field descriptions. To assist in soil classification and assessing long term stability of the site soils, physical characteristics, including bearing capacity, consolidation, unconfined compressive strength, natural moisture/density relationship, plasticity indices and sieve analyses were determined for the fine grained portion of all samples. Samples were then classified in conformance with the Unified Soil Classification System (USCS) per ASTM D-2487.

F.1. Soil Classification

The USCS identifies soil type by single letter prefix and subgroup by single letter suffix as follows;

<table>
<thead>
<tr>
<th>Soil Type</th>
<th>Prefix</th>
<th>Subgroup</th>
<th>Suffix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravel</td>
<td>G</td>
<td>Well Graded</td>
<td>W</td>
</tr>
<tr>
<td>Sand</td>
<td>S</td>
<td>Poorly Graded</td>
<td>P</td>
</tr>
<tr>
<td>Silt</td>
<td>M</td>
<td>Silty</td>
<td>M</td>
</tr>
<tr>
<td>Clay</td>
<td>C</td>
<td>Clayey</td>
<td>C</td>
</tr>
<tr>
<td>Organic</td>
<td>O</td>
<td>$w_L &lt; 50$ per cent</td>
<td>L</td>
</tr>
<tr>
<td>Peat</td>
<td>Pt</td>
<td>$w_H &gt; 50$ per cent</td>
<td>H</td>
</tr>
</tbody>
</table>

F.2. Electro-Chemical Parameters

Tests to determine electro-chemical characteristics were beyond the scope of this effort. In the event that chemically sensitive construction materials are proposed, we should be contacted and additional testing performed.

Considering the geologic parent material of Quaternary Alluvium, we recommend use of Type II cement (sulfate resistant) for concrete mix to be used in construction.

F.3. Strength Parameters

Strength parameters of cohesionless material were determined by the Standard Penetration Test, which are recorded on each Summary Log of Borings. The granular soils exhibit ultimate strengths ranging from 1,500 to 3,500 psf.
F.4. Performance Parameters

In addition to the strength parameters described above, consolidation characteristics of the soil were carefully considered, both in terms of primary and secondary (long term) settlement.

The granular materials are loose to very loose and will deform (consolidate) upon application of induced loads. The primary consolidation will be nearly immediate. Secondary consolidation will have occurred prior to completion of construction. Accordingly, there is little risk of long term settlement.

The organic component is present at a depth of 8'-0" below ground surface. This material has been pre-consolidated under the fill above. There is low risk of settlement of this material.

Recommended bearing pressures are presented in Section G of this report.

G. ENGINEERING STUDIES AND RECOMMENDATIONS

G.1. General

The engineering studies and recommendations summarized in this section provide design parameters for foundations for the proposed structure and for associated construction.

For the purposes of this analysis, column loads were assumed to be on the order of 40 kips. Wall loads were assumed to be on the order of 1 kip/lf. The dead load component was estimated to be 50% of total load.

All density criteria presented herein refer to ASTM D 1557 (Modified Proctor) at optimum to 2% above optimum moisture, unless specifically noted otherwise.

Pertinent geotechnical factors that may influence design and construction include;

- Control of both ground and surface water will be required during construction to facilitate constructability and during the life of the project to assure satisfactory long term performance.
- Stability of excavations during construction of all structures and trenches will require careful monitoring by the contractor.

G.2. Site Preparation and Grading

G.2.a. Clearing, Grubbing and Stripping

Because of the site topography, cuts and, to a lesser extent, fills will be required to accomplish overlot grading for the RV facility. Dredge spoils may be discovered during excavation at the site. If encountered, they will require removal and disposal. Prior to placement of fill, all existing top growth, sod and other deleterious material should be stripped from the site and disposed.
Excavated material can be expected to gain volume (fluff) between 5% and 10%, depending upon moisture content and method of excavation. Site materials used for fills can be expected to lose approximately 10% volume due to drying and consolidation.

PEI should be contacted to verify suitable subgrade.

G.2.b Removal of Unsuitable Soil

Where areas of unsuitable soil, wood waste, building debris or other deleterious materials are encountered during excavation, they should be removed and replaced with compacted structural fill with the over-excavation lined with Type 2 drainage geotextile as recommended or specified by Engineer.

G.2.c. Density Testing and Subgrade Re-compaction

After stripping, the exposed subgrade should be tested per Oregon Department of Transportation Test Method 158 (ODOT TM 158) and observed by the geotechnical engineer's representative. Such testing should not be attempted in wet weather and should be discontinued if the subgrade pumps, deflects under load or otherwise deforms.

Where soils are disturbed or if they pump when tested, they should be excavated, moisture conditioned and re-compacted or be replaced with imported structural fill. Effective re-compaction of the fine grained soil will require moisture conditioning. Moisture conditioning and re-compaction beneath pavement or slabs should extend to a depth of between 10 and 12 inches. The re-compaction should achieve 90% of maximum density, as determined by ASTM D-1557

In locations where the subgrade consists of soils that are firm and generally unyielding, moisture conditioning and re-compaction is not required. We should be contacted to perform in situ strength tests of subgrade soils and to advise regarding moisture conditioning and compaction.

G.3. Structural Fill Placement and Compaction

Structural fill is defined as any fill placed and compacted to specified densities and located under roadways, structures, driveways, sidewalks and other load-bearing areas, and specifically includes all site fills more than 4 feet thick.

G.3.a. Structural Fill Materials

Structural fill should consist of a free-draining granular material with a maximum particle size of 8 inches or 2/3 of the un-compacted lift thickness, whichever is lesser. The material should be well graded with less than 5 percent non-plastic fines. During dry weather, any organic-free, non-expansive, compactable granular material meeting the maximum size criteria is typically acceptable for this use. Locally available crushed rock and jaw run crushed shale have performed adequately for most applications of structural fill.
G.3.b. Structural Fill Placement

Structural fill should be placed in horizontal lifts not exceeding 8 inches loose thickness, or thinner if necessary to obtain specified density. Each lift should be compacted to 90% of the maximum density. The lift thickness may be increased if specified density is consistently being exceeded and approved by the Engineer.

In order to accomplish effective compaction for the full fill footprint, we recommend that fills be over built by five feet, then the face cut back to achieve the design fill face.

Structural fill placed beneath footings or other structural elements should be centered on the footing. Thickness of the structural fill will vary depending on the depth of suitable bearing conditions. The width of structural fill should be equal to the width of footing plus twice the depth of the structural fill beneath the footing.

G.3.c. Compaction

To facilitate the earthwork and compaction process, the earthwork contractor should place and compact fill materials at 1% to 2% above their optimum moisture content. If fill source soils are too wet to compact, they may be dried by continuous windrowing and aeration to achieve optimum moisture. If soils become dry, moisture should be added to maintain the moisture content at or near optimum during compaction operations.

If soil having swell potential is used for fills beneath structures, it should be moisture conditioned to 2% to 4% over optimum and compacted to 88% of maximum density. Swell properties should be determined by laboratory testing prior to use as structural fill.

G.3.c.1. Fill Observation and Testing Methods - Field density testing by nuclear methods is appropriate for compaction of 2½ - inch to ¾ - inch minus crushed base rock, fine grained soils, decomposed granite and other materials 2½ inches or smaller in size. Due to the effect of particle size on test methods, other methods of compaction testing may be favored. Testing of only the upper lifts is not adequate to verify compaction.

G.3.d. Non-Structural Fill

Stripped material should not be used as fill beneath permanent structures, roadway embankments, or as retaining wall backfill. If used as landscape fill, it should be placed and compacted to 88% density at 2% above optimum moisture and thoroughly processed to create a homogeneous fill. It should be limited to non-structural berms less than ten feet in height and having slopes no steeper than 3 ½ H to 1 V. Surface shrinkage cracks and long-term creep of even relatively flat slopes is probable on the surface of these silty SAND fills.

G.4. Slopes

Temporary cut and low, permanent fill slopes will be required for construction of the site fill and structure pad.
G.4.a. Cut Slopes

Permanent cut slopes will result from site excavation, overlot grading and placement of fills. Temporary cut slopes will be required for construction of retaining structures and other portions of the project. For brief periods, these may be excavated at steeper angles than listed above. The SILT soil may stand vertical to a depth of 4 feet for brief periods, except where saturated. In deeper trenches, side walls are likely to slough. We recommend cut slope angles no steeper than;

<table>
<thead>
<tr>
<th>Soil Classification</th>
<th>Type of Cut</th>
<th>Inclination</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAND</td>
<td>Temporary Cuts</td>
<td>1 H to 1V</td>
</tr>
<tr>
<td>SAND</td>
<td>Permanent Cuts</td>
<td>1¾ H to 1V</td>
</tr>
<tr>
<td>silty SAND</td>
<td>Temporary Cuts</td>
<td>1¼ H to 1V</td>
</tr>
<tr>
<td>silty SAND</td>
<td>Permanent Cuts</td>
<td>2 H to 1V</td>
</tr>
</tbody>
</table>

G.4.b. Fill Slopes

Permanent fill will be required to achieve a level pad. Fills may be constructed of imported rock, SHALE, SANDSTONE or compacted, blended, clean natural soil. All materials should be considered and constructed as Structural Fill, compacted as described above.

We recommend the following steepest fill slope inclinations.

<table>
<thead>
<tr>
<th>Soil Classification</th>
<th>Type of Fill</th>
<th>Inclination</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAND/silty SAND</td>
<td>All</td>
<td>1¾ H to 1V</td>
</tr>
<tr>
<td>Clean, crushed sedimentary rock</td>
<td>All</td>
<td>1¾ H to 1V</td>
</tr>
<tr>
<td>Compacted, crushed base course</td>
<td>All</td>
<td>1½ H to 1V</td>
</tr>
</tbody>
</table>

G.5. Paved Areas and Non-Structural Slabs on Grade

G.5.a. Density Testing and Subgrade Re-compaction

After stripping, the subgrade should be moisture conditioned and compacted to 90% of maximum dry density as determined by the Modified Proctor Compaction Test (ASTM D-1557) or 70% relative density. The compacted subgrade should then be proof rolled with a loaded dump truck or similar heavy vehicle to detect any unusually soft areas or organic deposits which would require removal and re-compaction.

G.5.b. Structural Fill Materials

Except for organic components, material excavated from the site may be used as fill.

G.5.c. Structural Fill Placement and Compaction

Beneath permanent structures or roadways, fill should be placed in lifts not exceeding 9 inches thick, measured loose, compacted to 90% of the maximum
dry density determined by ASTM D-1557, at plus or minus 2% of optimum moisture or at 70% relative density. Fills not beneath structures or paving may be compacted to 88% dry density per ASTM D-1557.

G.5.d. Removal of Unsuitable Soil

Soft areas discovered during proof rolling should be over excavated and filled with compactible material compacted as described above.

G.6. Site Drainage and Erosion Control

G.6.a. Buildings

Final grading should accomplish rapid positive drainage away from the structure for a horizontal distance of at least 10 feet at a minimum grade of 10%. This water should be channeled to surface drains or swales for proper disposal. The landscaping around the structure should be graded such that drainage discharges clear of the foundation influence area. Downspouts should be connected to a sealed system which discharges to a location clear of the foundation influence area.

G.6.b. Surface Areas

Surface and subsurface water flows should be intercepted by swales and/or catch basins and conveyed through tight lines to acceptable discharge locations. We recommend that hard surfaces be provided, sloped and shaped to channel water away from the structure.

G.6.c. Erosion Control

Site soils are moderately susceptible to erosion if unprotected. The site grades are such that erosion and sediment transport during construction are not expected to be significant. The site cuts and fills, building pad, etc. should be graded such that surface water is collected and disposed without causing erosion or siltation. Sediment laden water should not be allowed to flow directly into streams or off-site drainage systems.

Typical project landscaping should be adequate for long-term erosion control.

G.7. Building Foundations

G.7.a. General

A combination of spread and continuous footings is recommended for the structure. To compensate for swell pressures, footings should bear on non-swelling imported structural fill.

G.7.b. Imported Fill

G.7.b.1. Subgrade Preparation - After excavation, the subgrade should be moisture conditioned and compacted to 88% of maximum dry density at 2% above optimum moisture.
G.7.b.2. Structural Fill – Structural fill shall be placed and compacted to 90% of the modified proctor density per ASTM D1557.

G.7.b.3. Fill Placement - Fill should be placed in lifts not exceeding 10 inches thick, measured loose, and compacted to 90% of maximum dry density. Fills not beneath structures or paving may be compacted to 88% density.

G.7.b.4. Unsuitable Soil – Additional areas of unsuitable soil discovered during density testing should be over excavated and filled with structural fill material compacted as described above. If these occur locally beneath significant fills, they should be removed, if feasible, or stabilized by drainage if removal is not feasible. Please contact us for additional recommendations, if this condition is encountered.

G.7.b.5. Footing Embedment - Spread footings should be embedded a minimum of 18 inches below natural or finish grade to provide lateral support and frost protection. Footing excavations should be backfilled with structural fill.

G.7.b.6. Allowable Bearing Pressure – Building footings placed as recommended above may be designed for the following bearing pressures;

<table>
<thead>
<tr>
<th>Classification</th>
<th>Allowable Bearing Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Properly prepared natural site soils</td>
<td>1,500 #/ft²</td>
</tr>
<tr>
<td>Compacted structural fill</td>
<td>2,500 #/ft²</td>
</tr>
</tbody>
</table>

G.7.b.6a. Increases - Allowable bearing pressures may be increased as follows;

<table>
<thead>
<tr>
<th>Condition</th>
<th>Basis</th>
<th>Load Factor Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Square spread footings</td>
<td>Shape</td>
<td>20%</td>
</tr>
<tr>
<td>Live loads</td>
<td>Load Duration Factor</td>
<td>15%</td>
</tr>
<tr>
<td>Short term loads</td>
<td>Load Duration Factor</td>
<td>33%</td>
</tr>
</tbody>
</table>

G.7.b.7. Minimum Width - The minimum recommended width for continuous footings is 1'- 4" and the minimum recommended dimension for spread footings is 2'-0", except as required to accommodate swell pressure.
G.7.c. Footing Drains

We recommend that exterior footing drains be provided for below grade components, located at an elevation low enough to intercept groundwater and limit it from rising above the surface of crawlspaces and the bearing area of interior slabs on grade. Footing drains should discharge clear of the foundation influence area. See Section G.7.f.

G.7.d. Settlement

Building settlement will vary with thickness and swell/consolidation potential of fill, type and thickness of underlying soils and methodology of foundation construction. In addition to settlement, vertical movement due to swelling of the foundation soil is possible for lightly or differentially loaded structural components placed on over-compacted non-natural imported soil having swell potential.

Relying on the loads estimated herein and assuming that the dead load portion will be approximately 1/2 of the total, we project total vertical movement to be less than 1/2 inch. Differential movement between structural and non-structural components could be as much as ½ inch.

G.7.e. Interior Floor Slabs

Interior floor slabs should not be rigidly connected to the perimeter footing, i.e., should float within the structure. The following recommendations are provided for slabs constructed on structural fill over properly prepared subgrade soils;

G.7.e.1. Aggregate Base Course (ABC) - A 6 inch thick layer of clean (less than 2% passing the No. 200 sieve) ¾” minus crushed rock should be placed over the structural fill to provide a positive capillary moisture break and uniform slab support. The capillary break is essential in areas to receive tile and linoleum and other areas with relatively impermeable floor finishes. To decrease drying stress, a ¼ inch thickness of clean sand should be placed on top of the ABC.

G.7.e.2. Underslab Membrane - A moisture retarder or barrier should be used to decrease seepage or upward migration of moisture through the concrete, but is likely to increase soil moisture and exacerbate expansion if soils having expansion potential are imported. To protect the membrane, a ¼ inch thickness of clean sand should be placed on top of the membrane.

G.7.e.3. Minimum Slab Thickness - Minimum recommended slab thickness is 5 inches to allow sufficient cover over the reinforcing steel. Note that all slabs should be designed for the actual use and equipment anticipated.

G.7.e.4. Isolation - Floor slabs and walls, both bearing and non-bearing, resting on floor slabs should be isolated from other structural components. We would be pleased to provide typical isolation details or to review structural plans prepared by others.

G.7.e.5. Reinforcement - The slabs should be reinforced with deformed reinforcing steel instead of welded wire fabric.
G.7.e.6. Reinforcement Location - Locate reinforcing a dimension of 1/3 slab thickness below the surface. Use “dobies” or bolsters to establish accurate position of reinforcement.

G.7.e.7. Fiber - Polypropylene fiber may be added to the concrete mix to help decrease plastic shrinkage cracking; however it is not a replacement for structural reinforcing.

G.7.e.8. Joints - Contraction and control joints conforming to ACI recommendations should be incorporated in the construction. Saw cut joints or wet scored joints should be accomplished within 12 hours after concrete placement. Construction joints and joints across dissimilar pours should be joined by square dowels to decrease the potential for differential vertical movement or curling.

G.7.f. Footing and Floor Drains

G.7.f.1. Footing Drains - Drains should consist of a rigid, smooth interior perforated drain pipe placed adjacent to the base of the footing. The perforated pipe should be encapsulated in a minimum of 8 inches of clean drain rock or pea gravel wrapped in ODOT drainage geotextile Type 1.

G.7.f.2. Wall Drains - Drains are recommended for below grade walls. These walls should be provided a minimum 12-inch wide zone of drain rock isolated with non-woven drainage geotextile, continuous from the top of footing to one foot below the surface. A preformed, fabric-wrapped, polymer sheet drain, such as Linq Drain, Enkamat, or Amerdrain may be used instead of the vertical drainage zone, provided the excavation is backfilled with clean, free-draining material. Design of such walls should disregard friction between the wall and fill for stability computations, however. Walls demising habitable areas should be provided durable wall sealant coating or other water proofing membrane before installing the sheet drain.

G.7.f.3. Floor Subdrains - Where the drain rock layer below slabs will be lower than the adjacent exterior grades, water will tend to accumulate. In these locations, positive drainage of the under slab layer should be provided.

G.7.f.4. Discharge - Foundation drains and subdrains should be routed to discharge clear of the foundation influence area or slopes. *Interconnection of roof downspouts or surface area drains with foundation, wall, or floor subdrain systems is not allowed.*

G.8. Lateral Earth Pressures and Drainage

G.8.a. Lateral Load Resistance

Lateral loads exerted upon these structures can be resisted by passive pressure acting on buried portions of the foundation and other buried structures and by friction between the bottom of concrete elements of the foundations and slabs and the underlying soil.
Lateral load resistance should be calculated using the values presented in Section F.3 for the recommended depth of embedment as:

\[ P_a \text{ or } P_p = \frac{1}{2} k_{(a \text{ or } p)} \gamma H^2 \]  

where:

- \( P_a \) is active earth pressure
- \( P_p \) is passive earth pressure
- \( k_a = \tan^2 (45° - \phi/2) \)
- \( k_p = 1/ k_a \)
- \( \gamma \) = soil unit weight

The first one foot below the ground surface should be ignored when computing passive resistance.

- A coefficient of friction of 0.45 is recommended for elements poured neat against structural rock fill or bedrock.
- A coefficient of friction of 0.30 is recommended for elements poured against natural soils.
- The above values should be reduced to 0.2 for areas where bearing is over a non-soil vapor barrier or low permeability membrane.

### G.8.b. Lateral Earth Pressures

It is possible that both unrestrained and restrained retaining walls may be constructed for the project. Lateral earth pressures will be imposed on below-ground and backfilled structures or walls, including daylight basements and foundations which do not have uniform heights of fill on both sides. The following recommendations are provided for design and construction of retaining walls:

- Walls which are free to rotate at the top when backfilled should be designed for an equivalent fluid pressure of 45 #/ft³. This value should be increased to 52 #/ft³ for a 2 H to 1 V back slope.
- Walls that are fixed at the top should be designed for an equivalent fluid pressure of 60 #/ft³. This should be increased to 67 #/ft³ for a 2 H to 1 V back slope.
- A wet soil unit weight of 135 #/ft³ should be used for design.
- Backfill should consist of non-expansive, free draining, soil material. The backfill should be placed in lifts at near the optimum moisture content and compacted to between 88 and 90 % of the maximum density. Care should be employed to avoid over compacting the backfill. Loosely placed backfill and over-compacted backfill will exert greater pressures on the wall than the pressures considered above.
- To prevent damage, backfill and compaction against walls or embedded structures should be accomplished with hand-operated equipment within a lateral distance of 1/2 to 1/3 the unsupported height of wall. Beyond this zone, normal compaction equipment may be used.
- While proper compaction of wall backfill is critical to long-term performance, care should be taken to avoid over compaction of the backfill materials, which can result in lateral loads greater than the design pressures recommended above.

- For design of retaining walls supporting or bracing structures, a peak horizontal acceleration coefficient of 0.1g is recommended for seismic loads.

- To prevent development of hydrostatic pressures exceeding the lateral earth pressures, a perimeter drainage system is recommended for underground structures, including basements.

- Hydrostatic pressures behind retaining walls should be relieved by installation of free draining backfill behind the walls, with weep holes spaced as necessary (typically 10 feet on center) to achieve effective drainage. The free draining backfill should be protected from plugging by encapsulating with drainage geotextile as recommended above.

- Allowable bearing capacities should be as recommended for Building Structures.

G.9. Trenching and Piping

Additional underground piping will be constructed. Excavation can be accomplished by normal means. Depending on when construction occurs, dewatering of the trench may be necessary to facilitate construction.

- Pipe should be cradled in coarse aggregate compacted to 90% density, having a minimum thickness equal to 1/4 pipe diameter below bottom of pipe and extending upward to the pipe spring line.

- The trench backfill should consist of clean excavated material, compacted to 90% density.

- Beneath paved areas, full depth granular backfill is recommended as a minimum, and use of lean cement slurry should be considered.

- The top 12” of trench backfill should be compacted to a density of 92%. Loads on pipe will vary with depth and width of trench.

- For pipe design, an effective pressure of 130 #/ft³ per foot of depth is recommended.

Underground pipes located beneath paved areas and having shallow cover should be designed to withstand vehicular loads.

H. ADDITIONAL SERVICES AND LIMITATIONS OF REPORT

H.1. Additional Services

Additional services by the geotechnical engineer are recommended to help insure that design recommendations are correctly interpreted during final project design and to help verify compliance with project specifications during construction. Additional services could include, but not be limited to:
Review of final construction plans and specifications for compliance with geotechnical recommendations.

Attend project team meetings to clarify issues raised during the construction process.

Review and/or design of swale, fill and basement subdrain systems.

Review of proposed cuts and fills, fills on slopes, surface and subdrains, swale drains, foundation support, and basement or rock fill subdrains.

Site observation and/or CoMET services, i.e., observation of over excavated areas below keys, benches and footings and slabs, subgrade proof rolling, placement and compaction testing of structural fill, fill subdrains, swale subdrains, foundation drains, wall drains, subgrade proof rolling, pavement subgrade and aggregate base placement, site grading, surface drainage, etc.

Special Inspection as defined by the OSSC may be required for certain of the components.

Periodic construction field reports, as requested by the client and required by the building department

H.2. Limitations

Where used herein, the terms “Special Inspector, Inspector and Special Inspection” are understood to be for services contemplated, prescribed and as defined by the International Building Code and the Oregon Structural Specialty Code.

The analyses, conclusions and recommendations contained in this report are based on site conditions and development plans as they existed at the time of the study, and assume that soils and groundwater conditions encountered, observed or inferred during our exploration are representative of soils and groundwater conditions throughout the site. If, during construction, subsurface conditions are found to be different or design parameters change, we should be advised at once so that we can review this report and reconsider our recommendations, as appropriate. If there is a significant lapse of time between submission of this report and the start of work at the site, if the project is changed, or if site conditions have changed, we recommend that this report be reviewed to verify continued applicability.

This report was prepared for the use of the owner and design team for the subject project. It is only for this site and construction project. No third party beneficiaries are intended. Potential users of the report should be so notified.

It should be made available to other contractors for information and factual data only, such as test boring or test pit logs, measured water levels, samples, sample classifications and laboratory test results. The report is interpretive in nature and shall not be used for contractual purposes, such as warranting that subsurface conditions will be consistent with, or as indicated by the formal boring or test pit logs and subsurface profiles contained or inferred herein and/or discussions of subsurface conditions. It is not to be used for extensions of this project or for other projects without our express written consent. We should be contacted to review both plans and specifications for compatibility with this report before finalization. CoMET services, compaction testing and periodic observation during construction are recommended.
We have performed these services in conformance with generally accepted engineering and geotechnical engineering practices in southern Oregon at the time the study was accomplished. No other warranty is either expressed or implied.

Since test pits and borings represent only the conditions at those discrete locations, unanticipated soil conditions may be and, in fact, are commonly encountered on projects of similar size. Unanticipated conditions cannot be precluded by practical field studies. Since such unexpected conditions frequently result in budget increases to attain a properly constructed project, we recommend that a reasonable contingency account be established sufficient to fund possible extra costs.
FIGURES
SOIL TYPES (Ref. 1)

- **Boulders:** Particles of rock that will not pass a 12 inch screen.
- **Cobbles:** Particles of rock that will pass a 12 inch screen, but not a 3 inch sieve.
- **Gravel:** Particles of rock that will pass a 3 inch sieve, but a #4 sieve.
- **Sand:** Particles of rock that will pass a #4 sieve, but not a #200 sieve.
- **Silt:** Soil that will pass a #200 sieve, that is non-plastic or very slightly plastic, and exhibits little or no strength when dry.
- **Clay:** Soil that will pass a #200 sieve, that can be made to exhibit plasticity within a range of water contents, and that exhibits considerable strength when dry.

**MOISTURE AND DENSITY**

- **Moisture condition:** An observational term; moist, wet.
- **Moisture content:** The weight of water in a sample divided by the weight of dry soil in the sample, expressed as a percentage.
- **Dry Density:** The pounds of dry soil in a cubic foot of soil.

**DESCRIPTORS OF CONSISTENCY (Ref. 3)**

- **Liquid Limit:** The water content at which a - #200 soil is on the boundary between exhibiting liquid and plastic characteristics. The consistency feels like soft butter.
- **Plastic Limits:** The water content at which a - #200 soil is on the boundary between exhibiting plastic and semi-solid characteristics. The consistency feels like stiff putty.
- **Plasticity Index:** The difference between the liquid limit and the plastic limit, i.e. the range in water contents over which the soil is in a plastic state.

**MEASURES OF CONSISTENCY OF COHESIVE SOILS (CLAYS) (Ref's 2&3)**

<table>
<thead>
<tr>
<th>Consistency</th>
<th>N</th>
<th>C</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very soft</td>
<td>0-1</td>
<td>0-250 psf</td>
<td>Squeezes between fingers</td>
</tr>
<tr>
<td>Soft</td>
<td>2-4</td>
<td>250-500 psf</td>
<td>Easily molded by finger pressure</td>
</tr>
<tr>
<td>Medium stiff</td>
<td>5-8</td>
<td>500-1000 psf</td>
<td>Molded by strong finger pressure</td>
</tr>
<tr>
<td>Stiff</td>
<td>9-15</td>
<td>1000-2000 psf</td>
<td>Dented by strong finger pressure</td>
</tr>
<tr>
<td>Very stiff</td>
<td>16-30</td>
<td>2000-4000 psf</td>
<td>Dented slightly by finger pressure</td>
</tr>
<tr>
<td>Hard</td>
<td>&gt;30</td>
<td>&gt;4000 psf</td>
<td>Dented slightly by pencil point</td>
</tr>
</tbody>
</table>

*\(N\) = Blows per foot in the Standard Penetration Test. In cohesive soils, with the 3 inch diameter sampler. 140-pound weight, divide the blow count by 1.2 to get \(N\) (Ref. 4).

**MEASURES OF RELATIVE DENSITY OF GRANULAR SOILS (GRAVELS, SANDS, SILTS) (Ref's 2 & 3)**

<table>
<thead>
<tr>
<th>Consistency</th>
<th>N</th>
<th>RD</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Loose</td>
<td>0-4**</td>
<td>0-30</td>
<td>Easily push a ½ inch reinforcing rod by hand</td>
</tr>
<tr>
<td>Loose</td>
<td>5-10</td>
<td>30-50</td>
<td>Push a ½ inch reinforcing rod by hand</td>
</tr>
<tr>
<td>Medium Dense</td>
<td>11-30</td>
<td>50-70</td>
<td>Easily drive a ½ inch reinforcing rod</td>
</tr>
<tr>
<td>Dense</td>
<td>31-50</td>
<td>70-90</td>
<td>Drive a ½ inch reinforcing rod 1 foot</td>
</tr>
<tr>
<td>Very Dense</td>
<td>&gt;50</td>
<td>&gt;90-100</td>
<td>Drive a ½ inch reinforcing rod a few inches</td>
</tr>
</tbody>
</table>

**\(N\) = Blows per foot in the Standard Penetration Test. In granular soils, with the 3 inch diameter sampler, 140 pound weight, divide the blow count by 2 to get \(N\) (Ref 4). \(RD\) = Relative Density.

Ref. 1: ASTM Designation: D 2487-93, Standard Classification of Soils for Engineering Purposes(Unified Soil Classification system).
Geosynthetics and Slope Protection
Section 02320 - Geosynthetics
Description

02320.00 Scope - This section includes the requirements for geosynthetics used in various applications.

02320.01 Definitions - Geosynthetic terms are defined in 00350.01

Materials

02320.10 Acceptance:

(a) General Requirements - Furnish all geosynthetics meeting the following requirements:
- Free of defects, cuts or tears.
- Resistant to ambient temperatures, acid and alkaline conditions, micro-organisms and insects.
- For the intended purpose and have dimensional stability.

(1) Geotextiles - Furnish woven or nonwoven geotextiles meeting the following requirements:
- Be composed of long chain, synthetic polymeric filaments or yarns formed into a stable network that retains its relative structure during handling, placement and design service life. At least 95%, by weight, of the long chain polymers shall be on polyolefin or polyester.
- Meet or exceed the properties specified in 02320.20, Table 02320-1.
- Be free of any chemical treatment or coating which might significantly reduce permeability.
- Have the selvage finished to the outer fibers are prevented from pulling away from the fabric.

(2) Geogrids - Furnish geogrids meeting the following requirements:
- A regular network of integrally connected, polymer, tensile elements with aperture geometry sufficient to permit significant mechanical interlock with the surrounding soil or rock.
- Dimensionally stable and able to retain their geometry under manufacture, transport and installation.

(b) Acceptance Requirements - The actual minimum average roll values furnished by the manufacturer shall be based on representative test results from the manufacturing plant which produced the geosynthetic, and shall meet or exceed each of the specified minimum values. All geosynthetics shall be clearly labeled as being part of the same production run certified as meeting all applicable requirements.

(c) Manufacturer’s Documentation - Furnish a Level A or Level B certification, for the applicable geosynthetics.

(1) Level A - Manufacturer’s Test Result Certificate - Furnish a test result certificate from the geosynthetic manufacturer. The certificate shall:
- Include the minimum average roll values for each of the specified properties from the same production run as the delivered material.
- Include test results for factory seams.
- Include production run number, production plant name and location.

If the geosynthetic material is modified, remanufactured, relabeled or sewn, furnish an additional certificate from the supplier making the changes that explain the altered properties, seam strength or relabeling.

(2) Level B - Manufacturer’s Quality Compliance Certificate - As a basis of acceptance, furnish either a manufacturer’s brochure or a quality compliance certificate with geosynthetic properties shown.

If the brochure or certificate lists typical or average roll values instead of minimum average roll values, then increase by 25% the specified minimum values in Table 02320-1 for grab tensile strength, burst strength and puncture strength to determine compliance.

(d) Manufacturer’s Sampling/Testing - The manufacturer’s reported property values shall be based on the following sampling and testing requirements:

(1) Sampling - Sample all geosynthetics according to ASTM D 4394. The production unit used for sampling shall be a roll or sheet.
(2) Testing - Perform the specified tests to determine geotextile properties for the intended application(s). The tensile strength requirements shall be tested in both machine and cross-machine directions.

02320.11 Seam Testing and Acceptance:

(a) Factory Seams - Where factory seams are made, the sheets of geotextile shall:
- Be sewn together using a lock type stitch Type 301 or 401 as shown.
- Be sewn with polymeric thread that is at least 95%, by weight, polyolefin or polyester, and as resistant to deterioration as the geotextile being sewn.
- Have test results showing that the seams meet or exceed 90% of the specified tensile strength minimum values for intended application.
- Nylon thread will not be allowed.

(b) Field Seams - Where field sewn seams will be used, furnish:
- The manufacturer’s test result certificate, that includes wide strip, tensile strength test results and verifies that seams tensile strength and seam grab tensile strength meet or exceed 50% of the minimum specified tensile strength values for the geotextile.
- A field-stitched seam test sample.

SLOPE STABILIZATION
GEOSYNTHETICS TABLE
PROJECT: 30068.03 - SALMON HARBOR
CLIENT: DOUGLAS COUNTY

FIG. 5A
<table>
<thead>
<tr>
<th>GEOTEXTILE PROPERTY</th>
<th>TEST METHOD</th>
<th>UNITS</th>
<th>DRAINAGE (1)</th>
<th>RIP RAP</th>
<th>FILTRATION</th>
<th>SEDIMENT FENCE GEOTEXTILE</th>
<th>SUPPORTED</th>
<th>UNSUPPORTED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>WOVEN</td>
<td>NON-WOVEN</td>
<td>TYPE 1</td>
<td>TYPE 2</td>
<td>TYPE 1</td>
<td>TYPE 2</td>
</tr>
<tr>
<td>grab tensile strength (minimum)</td>
<td>ASTM D 4632</td>
<td>lb</td>
<td>180</td>
<td>115</td>
<td>180</td>
<td>115</td>
<td>180</td>
<td>115</td>
</tr>
<tr>
<td>machine direction cross machine direction</td>
<td></td>
<td></td>
<td>250</td>
<td>160</td>
<td>250</td>
<td>160</td>
<td>250</td>
<td>160</td>
</tr>
<tr>
<td>grab failure strain (minimum)</td>
<td>ASTM D 4632</td>
<td>%</td>
<td>&lt;50</td>
<td>&lt;50</td>
<td>&lt;50</td>
<td>&lt;50</td>
<td>&lt;50</td>
<td>&lt;50</td>
</tr>
<tr>
<td>tear strength (minimum)</td>
<td>ASTM D 4533</td>
<td>lb</td>
<td>67</td>
<td>40</td>
<td>90</td>
<td>56</td>
<td>90</td>
<td>56</td>
</tr>
<tr>
<td>puncture strength (minimum)</td>
<td>ASTM D 6241</td>
<td>lb</td>
<td>370</td>
<td>220</td>
<td>495</td>
<td>310</td>
<td>495</td>
<td>310</td>
</tr>
<tr>
<td>apparent opening size (ADS) (maximum)</td>
<td>ASTM D 4751</td>
<td>in</td>
<td>NO. 40</td>
<td>NO. 40</td>
<td>NO. 40</td>
<td>NO. 40</td>
<td>NO. 40</td>
<td>NO. 40</td>
</tr>
<tr>
<td>U.S. Standard Sieve</td>
<td>ASTM D 6241</td>
<td>lb</td>
<td>NO. 40</td>
<td>NO. 40</td>
<td>NO. 40</td>
<td>NO. 40</td>
<td>NO. 40</td>
<td>NO. 40</td>
</tr>
<tr>
<td>permittivity (minimum)</td>
<td>ASTM D 4491</td>
<td>s⁻¹</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>ultraviolet stability (Retained strength)</td>
<td>ASTM D 4355</td>
<td>%</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>70</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>(minimum)</td>
<td></td>
<td></td>
<td>500 hours</td>
<td>500</td>
<td>500</td>
<td>70</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>asphalt retention (minimum)</td>
<td>ODOT TM 817</td>
<td>oz/ft²</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>melting point (minimum)</td>
<td>ASTM D 276</td>
<td>°F</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
</tbody>
</table>

(1) Silt film or silt tape fabrics are not acceptable.
(2) As measured according to ASTM 4632.

NOTE: CONTRACTOR SHALL SUBMIT TO ENGINEER MATERIAL VENDOR DOCUMENTATION OF COMPLIANCE WITH GEOTEXTILE SPECIFICATIONS
APPENDIX A
TEST PIT AND TEST BORING
LOGS AND TESTS
<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>Description</th>
<th>PID ppm</th>
<th>Sample#</th>
<th>Soil Type</th>
<th>Sampler</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SW-SAND, light to medium brown, moist</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>CL- sandy CLAY, dark brown</td>
<td>34870</td>
<td>34869</td>
<td>BKT</td>
<td>CAL</td>
</tr>
<tr>
<td>10</td>
<td>END TEST PIT AT 10 FEET.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TEST RESULTS**

- Plastic Limit
- Liquid Limit
- Water Content - ●
**Natural Moisture Density Report**

**Project:** Salmon Harbor RV Park

**Contractor:** NA

**Subject:** Geotech - Natural Moisture

**Tested By:** TJB

**Testing Date:** 8/9/18

<table>
<thead>
<tr>
<th>Bore Hole</th>
<th>Sample No.</th>
<th>34879</th>
<th>34876</th>
<th>34875</th>
<th>34873</th>
</tr>
</thead>
<tbody>
<tr>
<td>T92 @ 12'</td>
<td>Length 1 (in.)</td>
<td>3.55</td>
<td>4</td>
<td>3.6</td>
<td>3.9</td>
</tr>
<tr>
<td>T92 @ 4'</td>
<td>Length 2 (in.)</td>
<td>3.7</td>
<td>3.7</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>T81 @ 12'</td>
<td>Length 3 (in.)</td>
<td>3.75</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>T81 @ 7'</td>
<td>Avg Length (in.)</td>
<td>3.67</td>
<td>4.00</td>
<td>3.77</td>
<td>3.87</td>
</tr>
<tr>
<td>Diameter 1 (in.)</td>
<td>1.9</td>
<td>1.9</td>
<td>1.9</td>
<td>1.9</td>
<td></td>
</tr>
<tr>
<td>Diameter 2 (in.)</td>
<td>1.9</td>
<td>1.9</td>
<td>1.9</td>
<td>1.9</td>
<td></td>
</tr>
<tr>
<td>Avg Diameter (in.)</td>
<td>1.9</td>
<td>1.9</td>
<td>1.9</td>
<td>1.9</td>
<td></td>
</tr>
</tbody>
</table>

| Volume (ft³) | 0.01 | 0.01 | 0.01 | 0.01 |
| Tare (gram)  | 32.7 | 33.6 | 49.4 | 33.5 |
| Wet + Tare (gram) | 317.1 | 326.2 | 416 | 336.7 |
| Dry + Tare (gram) | 302.9 | 315.2 | 349.4 | 324.8 |
| Dry Weight (gram) | 270.2 | 281.6 | 300 | 291.3 |
| Water (gram) | 14.2 | 11 | 66.6 | 11.9 |
| % Moisture | 5.3% | 3.9% | 22.2% | 4.1% |

**Density (PCF):**

| Bore Hole | 99.3 | 94.9 | 107.3 | 99.0 |

**Remarks:**

Reviewed By: ___________________________  Date: ___________________________

*"Special Inspection", "Inspection" and "Inspector" are terms as defined by the International Building Code*
<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Description</th>
<th>PID ppm</th>
<th>Sample#</th>
<th>Soil Type</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>ML-sandy SILT w/ crushed agg. (pit run) and siltstone, light brown, medium dense</td>
<td></td>
<td>34871</td>
<td>CAL</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>34872</td>
<td>BAG</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>SM-SAND, light brown, moist</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>CL-sandy CLAY, dark brown, moist</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>END TEST PIT AT 12 FEET.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depth (feet)</td>
<td>Description</td>
<td>Recov (%)</td>
<td>Drivns (ft)</td>
<td>PID ppm</td>
<td>Sample#</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------------------</td>
<td>-----------</td>
<td>-------------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>0</td>
<td>SW-SAND, light brown</td>
<td>12</td>
<td>18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td>0</td>
<td>0</td>
<td></td>
<td>34873</td>
</tr>
<tr>
<td>4</td>
<td>SW-SAND, dark brown, moist</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>34874</td>
</tr>
<tr>
<td>12</td>
<td>END TEST BORE AT 12 FEET</td>
<td>8</td>
<td>18</td>
<td></td>
<td>34875</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The information pertains only to this boring and should not be interpreted as being indicative of the site.
<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Description</th>
<th>Recover (in)</th>
<th>Driven (in)</th>
<th>Sample#</th>
<th>Soil Type</th>
<th>Sampled</th>
<th>Symbol</th>
<th>Plastic Limit</th>
<th>Liquid Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>SW-SAND, light brown, moist</td>
<td>12</td>
<td>18</td>
<td>34876</td>
<td>SPT</td>
<td></td>
<td></td>
<td>4-5-4 (N=9)</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>12</td>
<td>18</td>
<td>34877</td>
<td>SPT</td>
<td></td>
<td></td>
<td>5-3-4 (N=7)</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td>34878</td>
<td>BAG</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>END TEST BORE AT 12 FEET</td>
<td>4</td>
<td>18</td>
<td>34879</td>
<td>SPT</td>
<td></td>
<td></td>
<td>7-14-16 (N=30)</td>
<td></td>
</tr>
</tbody>
</table>
## TEST LOG

**TB3**

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Description</th>
<th>Recov (ft)</th>
<th>Driven (in)</th>
<th>P/D ppm</th>
<th>Sample#</th>
<th>Soil Type</th>
<th>Sampler</th>
<th>Symbol</th>
<th>Plastic Limit</th>
<th>Liquid Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>ML-sandy SILT, light brown, moist</td>
<td>8</td>
<td>18</td>
<td>34880</td>
<td></td>
<td>BAG</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>SW-SAND, medium brown, moist</td>
<td>8</td>
<td>12</td>
<td>34881</td>
<td></td>
<td>SPT</td>
<td></td>
<td></td>
<td>4-5-8 (N=13)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>some fractured siltstone</td>
<td>8</td>
<td>12</td>
<td>34882</td>
<td></td>
<td>SPT</td>
<td></td>
<td></td>
<td>2-5-0 (N=5)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>SW-SAND, dark brown, moist</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>ROCK</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>SPT</td>
<td></td>
<td></td>
<td>50-0-0 (N=0)</td>
<td></td>
</tr>
</tbody>
</table>

**END TEST BORE AT 10 FEET. PRACTICAL REFUSAL**
1 May 2019

HGE Inc.
333 South 4th Street
Coos Bay, OR 97420

Attn: Joe Slack

Re: Salmon Harbor RV Park Expansion
Pavement Design

Dear Mr. Slack,

Representatives of Pinnacle Engineering, Inc. (PEI) have reviewed the proposed site plan for the RV park expansion. At your request, PEI has conducted a pavement analysis with a ten year design life for the driveway and paved spaces within the expansion.

Note, traffic count estimates were base based on the number of spaces for the expansion and includes added daily traffic from typical vehicles that would enter the area analyzed. Number of passes should be reviewed by the owner to verify accuracy.

**Paving**

Performance of paved surfaces is closely connected to traffic volume and weight and to design life. For the purposes of this analysis, we have assumed traffic 7 days a week at 52 weeks per year for a 10 year pavement design life

<table>
<thead>
<tr>
<th>Type of Vehicle</th>
<th># of Passes</th>
<th>Passes Per Year</th>
<th># of 18 Kip ESALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger Car</td>
<td>250</td>
<td>91,000</td>
<td>360</td>
</tr>
<tr>
<td>Recreational Vehicle</td>
<td>250</td>
<td>91,000</td>
<td>3,640</td>
</tr>
<tr>
<td>Garbage Truck</td>
<td>2</td>
<td>728</td>
<td>18,750</td>
</tr>
<tr>
<td>Delivery Truck</td>
<td>2</td>
<td>728</td>
<td>2,830</td>
</tr>
<tr>
<td>Beverage Truck</td>
<td>2</td>
<td>728</td>
<td>2,830</td>
</tr>
<tr>
<td>Semi Tractor Trailer</td>
<td>2</td>
<td>728</td>
<td>34,200</td>
</tr>
</tbody>
</table>

**Total # of 18 Kip ESALS** | **62,610**

If traffic volumes significantly different than the above are anticipated, we should be notified immediately, in order that we may adjust these recommendations as appropriate.

Paving should consist of compacted bituminous surface mix over a layer of 1 1/2” minus aggregate base. Preliminary cost analyses and assumptions are as follows;
CBR = 8.0
Serviceability Factor = 2.0
Subgrade Resilient Modulus, psi = 7,200
Design Life = 10 years
Regional Factor = 1.0
Design Life, 18 Kip ESALS = 100,000
Standard Deviation = 0.49

<table>
<thead>
<tr>
<th>Description</th>
<th>Structural Coefficient</th>
<th>No. 1</th>
<th>No. 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt Section</td>
<td>0.41</td>
<td>3&quot;</td>
<td>4&quot;</td>
</tr>
<tr>
<td>Durable, well graded, angular, 1 1/2&quot;-0(#200&lt;5%)</td>
<td>0.14</td>
<td>10&quot;</td>
<td>8&quot;</td>
</tr>
</tbody>
</table>

Two pavement sections were designed to provide the designer/owner an additional option for potential cost savings or shallower footprint.

Material quality and placement of the surface assembly should conform to the current edition of the ODOT Standard Specifications for Construction.

Conclusions

A stabilized pavement design was considered, however, it was determined the added stabilization grid would not be cost effective for replacing a portion of the aggregate base course layer.

Limitations

The referenced site observations were performed for you, at your request and were conducted specifically within the RV Park Expansion shown on sheet C2.0 of the civil engineering plans. There are no intended third party beneficiaries to this report. Subsequent users of this report should be so notified.

Our conclusions are based on the actual areas observed. Our firm warrants only that our methods of analysis and conclusions conform to currently accepted practice of other engineering and geotechnical engineering professionals of similar experience employed on engagements of similar complexity in the area at the time of service. No other warranty is expressed or implied.

The analyses, conclusions and recommendations contained in this report are based on site conditions as they presently exist and assume that the foundation soils are typical of those visible presented in the project geotechnical report. If, during construction, subsurface conditions different are observed or appear to be present beneath any excavation, we should be contacted immediately so that we can review these conditions and reconsider our recommendations where necessary.
We appreciate the opportunity to assist you on your project. If you have any questions or, if we may be of further assistance, please do not hesitate to contact us.

Matt Keller, PE, CSI.
Project Engineer
President
Design Parameters for AASHTO (1993) Equation

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability (%)</td>
<td>95</td>
</tr>
<tr>
<td>Initial Serviceability</td>
<td>4.1</td>
</tr>
<tr>
<td>Standard Normal Deviate</td>
<td>-1.645</td>
</tr>
<tr>
<td>Terminal Serviceability</td>
<td>2.0</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>0.49</td>
</tr>
<tr>
<td>Change in Serviceability</td>
<td>2.1</td>
</tr>
</tbody>
</table>

Aggregate fill shall conform to following requirement:

D50 ≤ 27mm (Base course)

Unstabilized Section Material Properties

<table>
<thead>
<tr>
<th>Layer</th>
<th>Description</th>
<th>Cost ($/ton)</th>
<th>Layer coefficient</th>
<th>Drainage factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC1</td>
<td>Asphalt Wearing Course</td>
<td>70</td>
<td>0.420</td>
<td>N/A</td>
</tr>
<tr>
<td>ABC</td>
<td>Aggregate Base Course</td>
<td>20</td>
<td>0.140</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Stabilized Section Material Properties

<table>
<thead>
<tr>
<th>Layer</th>
<th>Description</th>
<th>Cost ($/ton)</th>
<th>Layer coefficient</th>
<th>Drainage factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC1</td>
<td>Asphalt Wearing Course</td>
<td>70</td>
<td>0.420</td>
<td>N/A</td>
</tr>
<tr>
<td>MSL</td>
<td>Mechanically Stabilized Base Course</td>
<td>20</td>
<td>0.270</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Unstabilized Pavement

- ACC1 3.00 (in)
- ABC 10.00 (in)

Subgrade Modulus = 7,200 (psi)
Structural Number = 2.660
Calculated Traffic (ESALs) = 121,000

Stabilized Pavement

- ACC1 3.00 (in)
- MSL 6.00 (in)

Tensar TX5 (Overlap=1.0ft)
Subgrade Modulus = 7,200 (psi)
Structural Number = 2.880
Calculated Traffic (ESALs) = 202,000

LIMITATIONS OF THE REPORT

The designs, illustrations, information and other content included in this report are necessarily general and conceptual in nature, and do not constitute engineering advice or any design intended for actual construction. Specific design recommendations can be provided as the project develops.

Project Name: Salmon Harbor RV Park Expansion
Company Name: Pinnacle Engineering, Inc.
Designer: MRK
Date: 5/1/19

This document was prepared using SpectraPave4 PRO™ Software Version 4.6.1
Developed by Tensar International Corporation
Copyright 1998 - 2014, All Rights Reserved.
Design Parameters for AASHTO (1993) Equation

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability (%)</td>
<td>95</td>
</tr>
<tr>
<td>Standard Normal Deviate</td>
<td>-1.645</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>0.49</td>
</tr>
</tbody>
</table>

Aggregate fill shall conform to following requirement:

D50 <= 27mm (Base course)

Unstabilized Section Material Properties

<table>
<thead>
<tr>
<th>Layer</th>
<th>Description</th>
<th>Cost ($/ton)</th>
<th>Layer coefficient</th>
<th>Drainage factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC1</td>
<td>Asphalt Wearing Course</td>
<td>70</td>
<td>0.420</td>
<td>N/A</td>
</tr>
<tr>
<td>ABC</td>
<td>Aggregate Base Course</td>
<td>20</td>
<td>0.140</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Stabilized Section Material Properties

<table>
<thead>
<tr>
<th>Layer</th>
<th>Description</th>
<th>Cost ($/ton)</th>
<th>Layer coefficient</th>
<th>Drainage factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC1</td>
<td>Asphalt Wearing Course</td>
<td>70</td>
<td>0.420</td>
<td>N/A</td>
</tr>
<tr>
<td>MSL</td>
<td>Mechanically Stabilized Base Course</td>
<td>20</td>
<td>0.270</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Unstabilized Pavement

- ACC1: 4.00 (in)
- ABC: 8.00 (in)

Subgrade Modulus = 7,200 (psi)
Structural Number = 2.800
Calculated Traffic (ESALs) = 168,000

Stabilized Pavement

- ACC1: 3.00 (in)
- MSL: 6.00 (in)

Tensar TX5 (Overlap=1.0ft)

Subgrade Modulus = 7,200 (psi)
Structural Number = 2.880
Calculated Traffic (ESALs) = 202,000

LIMITATIONS OF THE REPORT

The designs, illustrations, information and other content included in this report are necessarily general and conceptual in nature, and do not constitute engineering advice or any design intended for actual construction. Specific design recommendations can be provided as the project develops.
SECTION 01-1000
SUMMARY

PART 1 GENERAL

1.01 PROJECT

A. Project Name: Salmon Harbor Marina - RV Expansion – Site Work
B. Owner's Name: Salmon Harbor Management Committee.
C. Architect's Name: HGE Inc., Architects, Engineers, & Planners.
D. The Work consists of furnishing all labor, materials, equipment, incidentals and performing all
   Work required for all site improvements to accommodate a 40-full hookup RV site on an
   undeveloped parcel of Salmon Harbor property, located on the west spit. Site improvements
   include clearing, grading, paving, pedestrian walks, sanitary sewer, waterlines, storm drainage
   improvements, electrical, other utility connections, landscape irrigation, seeding, and other work
   as described in the construction documents. This work is in conjunction with the
   Restroom/Shower/Laundry Building construction and Contractor is required to coordinate and
   cooperate with the building contractor as the work will occur concurrently. All building site work
   as delineated on the drawings will be by site contractor. Work includes all adjacent site work,
   including paving, concrete paving/walks, utility connections beyond 5 feet from building, cutting
   subgrade for building, and final grading around building

1.02 EXPLANATION OF CONTRACT DOCUMENTS:

A. The Conditions of the Contract and the General Requirements (Division 1) of these
   Specifications apply to the Work described under each Section hereof. The Contractor shall
   instruct each subcontractor, if used, to become fully familiar with them.

1.03 DIVISION AND PARAGRAPH NUMBERING:

A. Numbering and lettering of Divisions and Paragraphs in these Specifications are merely for
   identification and may not be consecutive.

1.04 SUB-CONTRACTS:

A. Divisions of Specifications into trade Sections conforms roughly to customary practice. They
   are used for convenience only. Salmon Harbor Management Committee is not bound to define
   limits of any subcontract and will not enter into disputes between the Contractor and his
   employees, including subcontractors.

1.05 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Where references are made to other Sections regarding Related Requirements Specified
   Elsewhere, it is for the convenience of the Contractor only and shall not limit the Contractor's
   responsibility under other Sections not so referenced. As previously noted, each Section of the
   Specifications is bound by all applicable requirements of all Sections in Division 1.

1.06 WORDING OF SPECIFICATIONS:

A. These are abbreviated or "streamline" type specifications and frequently include incomplete
   sentences. The omission of words or phrases such as "The Contractor shall", "according to the
   drawings", "in conformity with", "shall", "shall be", "as noted", "a", "an", "and", are all intentional.
   Omitted words or phrases shall be supplied by inference, in the same manner as they are in the
   notes on the Drawings. Titles and headings are frequently a part of the Specifications, and the
   same as the text of the article or paragraph. Where question arises as to wording in the
   Drawings and Specifications, consult SHMC.

1.07 WORK COVERED BY CONTRACT DOCUMENTS:

A. Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for
   all labor, materials, equipment, tools, construction equipment and machinery, water, heat,
   utilities, permits, fees, transportation, incidentals, and other facilities and services necessary for
   the proper execution and completion of the Work, whether temporary or permanent and
   whether or not incorporated or to be incorporated in the Work.
1.08 ADDITIONAL DEFINITIONS:
   A. The term "approved" means "approved by Salmon Harbor Management Committee".
   B. The term "for approval" means "for Salmon Harbor Management Committee's approval".
   C. The term "as directed" means "as directed by Salmon Harbor Management Committee".
   D. The term "product" includes materials, systems, and equipment.
   E. The term "provide" means "furnish and install, complete, in place and ready for operation and use".
   F. The term "selected" means "selected by Salmon Harbor Management Committee".
   G. The term "Substantial Completion" or "Substantially Complete" means ready for occupancy and use by Salmon Harbor Management Committee.
   H. Items "furnished by SHMC" shall be installed by the contractor unless noted otherwise.
   I. Where the words "or approved" are used, SHMC is the sole judge of quality and suitability of proposed substitution.

1.09 WORK BY OTHERS:
   A. Items specifically noted in the Contract Documents as:
      a. "By Others"
      b. "N.I.C." (Not in Contract)
      c. "By Salmon Harbor Management Committee"
   B. Building:
      1. Restroom/Shower/Laundry Building construction work.

1.10 SALMON HARBOR MANAGEMENT COMMITTEE FURNISHED ITEMS:
   A. Items specifically noted: "Furnished by SHMC" or FBSHMC.
      1. SHMC furnished items shall be installed by the Contractor unless noted otherwise.

1.11 UNACCEPTABLE EXISTING CONDITIONS:
   A. Exposed to view, or noted in the Contract Documents, or otherwise accessible to verify prior to bid opening date:
      1. Repair or replace as part of this Work.
         a. No additional payments by SHMC will be made.
      2. Concealed, and not accessible to verify prior to bidding:
         a. Repair or replace where necessary;

1.12 CONTRACTOR USE OF PREMISES:
   A. The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits and the Contract Documents, and shall not unreasonably encumber the site with any materials or equipment.
      1. Confine operations to Project Areas directed by SHMC.
      2. Obtain SHMC's permission for use of any existing facilities, utilities, areas, materials, etc., not specifically provided for the Contractor's use in the Contract Documents.
   B. This work will occur concurrently with the Restroom/Shower/Laundry Building construction work and Contractor required to coordinate his/her efforts with the efforts of the building contractor.

1.13 CONTRACT DESCRIPTION
   A. Contract Type: One single prime contract based on a Stipulated Price.

1.14 WORK SEQUENCE
   A. Contractor to coordinate site deliveries with building contractor. Site contractor is required to accommodate building contractor within reason to provide access to building site. It is
understood that site contractor will build access road for building contractors use to building site and provide reasonable staging area for building contractor.

PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED

END OF SECTION
SECTION 01-2300
ALTERNATES

PART 1  GENERAL
1.01  SECTION INCLUDES
A. Description of Alternates.

1.02  ACCEPTANCE OF ALTERNATES
A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner’s option. Accepted Alternates will be identified in the Owner-Contractor Agreement.
B. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

1.03  SCHEDULE OF ALTERNATES
A. Alternate Bid #1:
   1. Base Bid Item: No Work.
   2. Alternative Item: Grade and Landscaping on Existing Slope (ADD to Base Bid), as noted in the Drawings.

B. Alternate Bid #2:
   1. Base Bid Item: Contractor to prepare planter areas per landscape plans. Plants to be furnished and installed by SHMC.
   2. Alternate Item: Furnish and install plants as shown in the Drawings.

PART 2  PRODUCTS - NOT USED
PART 3  EXECUTION - NOT USED

END OF SECTION
SECTION 01-3000
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Preconstruction meeting.
   B. Progress meetings.
   C. Construction progress schedule.
   D. Submittals for review, information, and project closeout.
   E. Number of copies of submittals.
   F. Submittal procedures.

1.02 RELATED REQUIREMENTS
   A. Section 01-7000 - Execution and Closeout Requirements: Additional coordination requirements.

1.03 PROJECT COORDINATION
   A. Project Coordinator: Project Coordinator shall be HGE Inc., Architects, Engineers & Planner. Contractor is responsible for project coordination per contract requirements.
   B. Cooperation between the various crafts of other contracts and subcontractors shall be required for proper execution of the Work.
   C. Prior to the installation of materials or equipment with the Work of other Sections, by SHMC, or by other contracts, verify the requirements of the other crafts or other contract materials or equipment.
   D. Bring deviations to the attention of Project Coordinator immediately.
   E. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for access, traffic, and parking facilities.
   F. During construction, coordinate use of site and facilities through the Project Coordinator.
   G. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
   H. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities.
   I. Coordinate field engineering and layout work under instructions of the Project Coordinator.
   J. Make the following types of submittals to the Project Coordinator:
      1. Requests for interpretation.
      2. Requests for substitution.
      3. Shop drawings, product data, and samples.
      4. Design data.
      5. Manufacturer's instructions and field reports.
      6. Applications for payment and change order requests.
      7. Progress schedules.
      8. Coordination drawings.

PART 2 PRODUCTS

2.01 SHOP DRAWINGS:
   A. Defined as: Original drawings prepared by the Contractor, Subcontractor, Supplier or Distributor which illustrate some portion of the Work; showing fabrication, layout, setting or erection details.
B. Identify details by reference to contract sheet and detail number.
C. Minimum size sheet 8"x11", maximum 24"x36".

2.02 PRODUCT DATA:
A. Manufacturer's standard schematic drawings;
   1. Modify to delete extraneous information.
   2. Supplement standard information as applicable to project
B. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts,
   illustrations and other standard descriptive data;
   1. Clearly mark each copy to identify pertinent materials, products or models.
   2. Show dimensions, weights, and clearances required.
   3. Show performance data.

2.03 SAMPLES:
A. Defined as: Physical examples to illustrate materials, colors, equipment or workmanship, and
   to establish standards by which completed work is judged.
B. Office Samples: Sufficient size and quantity to illustrate:
   1. Functional characteristics of product or material, with integrally related parts and
      attachment devices.
   2. Full range of color samples.
C. Field samples and mock-ups:
   1. Erect at Project site in location acceptable to SHMC.
   2. Include work of all trades required in finished work.
   3. After review, approved field samples may be used in construction of Project.

PART 3 EXECUTION

3.01 PRECONSTRUCTION MEETING
A. Architect / Project Coordinator will schedule a meeting after Notice of Award.
B. Attendance Required:
   1. Owner.
   2. Architect / Project Coordinator.
   3. General Contractor, contractor's superintendent(s) and major subcontractors.
C. Agenda:
   1. Distribution of Contract Documents.
   2. Designation of personnel representing the parties to Contract, Owner and Architect / Project Coordinator.
   3. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
   4. Scheduling.
D. Record minutes and distribute copies within three days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.02 PROGRESS MEETINGS
A. Schedule and administer meetings throughout progress of the Work at maximum monthly intervals.
B. Architect / Project Coordinator will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
C. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner, Architect / Project Coordinator, as appropriate to agenda topics for each meeting.
D. Agenda:
   1. Review minutes of previous meetings.
   2. Review of Work progress.
3. Field observations, problems, and decisions.
4. Identification of problems that impede, or will impede, planned progress.
5. Review of submittals schedule and status of submittals.
6. Maintenance of progress schedule.
7. Corrective measures to regain projected schedules.
8. Planned progress during succeeding work period.
10. Effect of proposed changes on progress schedule and coordination.
11. Other business relating to Work.

E. Record minutes and distribute copies within three days after meeting to participants, with copies to Architect / Project Coordinator, Owner, participants, and those affected by decisions made.

3.03 CONSTRUCTION PROGRESS SCHEDULE
A. Contractor’s Construction Schedule:
1. Prior to proceeding with the Work, Contractor shall meet with Salmon Harbor Management Committee and Project Coordinator to develop a proposed progress schedule. The progress schedule shall include dates of submission and dates reviewed submittals will be required for each product, as well as the dates for starting and completion of the various stages of the project.
2. Include critical dates for procurement of products.
3. If determined by SHMC and Project Coordinator that Work progress falls behind approved Schedule, Contractor shall take necessary action to regain lost time. Contractor shall increase Work amount, or number of shifts, or establish overtime operations, or all of them, and submit for review Schedule revisions in which progress rate will be regained, all without additional cost to SHMC.
4. Contractor’s failure to comply with any of these requirements shall be grounds for determination that the Contractor is not prosecuting the Work with such diligence as will insure Project completion within specified time. Upon such determination, SHMC may terminate Contractor’s right to proceed with the Work, or any separable part thereof, in accordance with Contract Conditions.
5. Testing Schedule
   a. Contractor to submit testing schedule based upon project requirements to be reviewed by SHMC and Project Coordinator. Additional Testing and Special Inspection requirements may be requested at the discretion of the Project Coordinator. Refer to Section 01-4000 Quality Requirements.

3.04 SUPERINTENDENT
A. General Contractor’s Superintendent (as defined in the General Conditions) shall remain at project site during all times during which Work under this contract is being carried out, regardless of the type of trades involved or apparent significance of work being performed.
B. Superintendent shall not be changed or replaced prior to Final Completion of the project without SHMC’s written consent.

3.05 COORDINATION:
A. Do all necessary work to receive or join work of all trades.
B. Coordinate the Work to provide adequate clearances for proper installation and maintenance of materials and equipment.
C. Work closely with Salmon Harbor Management Committee and Project Coordinator and be prepared to proceed with work when called upon to insure work of other contracts is not delayed or work of this contract does not delay progression of overall project.
3.06 SUBMITTALS:

A. Submittals are defined as documents required by the Contract to be submitted to Project Coordinator for review, and may include shop drawings, product data, samples, or a schedule of construction events.

B. Shop drawings, Product Data, Samples and other Submittals are not part of the Contract. Their purpose is to demonstrate, for those portions of the Work for which Submittals are required, the way the Contractor proposes to conform to the requirements of the Contract and the design concept expressed in the Contract.

C. The Contractor shall review, approve and submit to Project Coordinator all Shop Drawings, Product Data, Samples and other Submittals required by the Contract regardless of whether the document originated with the Contractor or with some other subcontractor or supplier. They shall be submitted at the time required by the Contract, or, if no time is specified, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of SHMC or of separate contractors. Submittals made by the Contractor that are not required by the Contract may be returned without action or may not be returned at all.

D. Informational Submittals upon which Project Coordinator is not expected to take responsive action may be so identified in the Contract.

E. Project Coordinator’s review of any Submittal does not relieve the Contractor from its responsibility to follow the requirements of the Contract. The Project Coordinator is not responsible for ensuring that Submittals are correct. Failure of the Project Coordinator to discover that a submittal varies from the requirements of the Contract Documents shall not relieve the Contractor of its responsibilities to conform to the Contract nor provide a basis for a change order. Nevertheless, the Project Coordinator shall review any Submittals provided in order to make a general determination about whether they appear to meet Contract requirements or the intended design of the project. The Contractor remains responsible for following the contract, including, but not limited to the following:

1. Review submittals prior to submission to Project Coordinator. The Contractor shall expressly note where any submittal differs from or varies from the requirements of the Contract, notwithstanding any belief on the part of the Contractor that the variance is obvious.

2. Verify: field measurements, field construction criteria, catalog numbers and similar data.


4. Contractor’s responsibility for errors and omissions in submittals is not relieved by SHMC’s / Project Coordinator’s review of submittals.

5. Contractor’s responsibility for deviations from the Contract Documents is not relieved by review of submittals unless SHMC / Project Coordinator gives written acceptance of specific revisions.

6. Begin no work which requires submittals until return of submittals with appropriate stamp and initials or signature indicating approval.

F. Submittals shall Include:

1. Date and revision dates.
2. Project title and number.
3. Name of Contractor, Supplier and Manufacturer.
4. Identification of product material.
5. Relation to adjacent structure or material; field dimensions, clearly identified as such; other dimensions critical to product installation, or relevant to installation of other adjacent products.
6. Specification Section number.
7. Applicable standards such as ASTM, Federal Specification, etc.
9. Contractor’s note or stamp, initialed or signed, certifying to review of submittal, verification of field measurements and compliance with Contract Documents.

10. Transmittal letter with all submittals containing: the number of drawings, data or samples submitted; notification of deviation from the Contract Documents; other pertinent data

G. Submission Requirements:
   1. Submit at least 10 days before the date each reviewed submittal is needed.
   2. Submit number of copies of shop drawings and product data which the Contractor requires for distribution plus 2 copies which SHMC will retain.
   3. Submit at least 3 each of required office samples unless otherwise specified in the applicable Specification Sections.

H. RESUBMISSION REQUIREMENTS:
   1. Revise initial drawings as required and resubmit as specified for initial submittal.
   2. Indicate changes which have been made other than those requested by SHMC

3.07 CONTINUED USE OF FACILITIES BY SALMON HARBOR MANAGEMENT COMMITTEE:
   A. Coordinate with SHMC for continued use of other facilities during construction. Obtain schedule of events for SHMC and work with SHMC Staff to allow activities identified in schedule to occur with minimal disruption by work of this contract.

PART 4 – PAYMENT

4.01 MEASUREMENT AND PAYMENT

   A. No separate measurement and/or payment will be made for any/all work and items specified or required by this Section. All requirements of this Section are considered incidental to the project and shall be fulfilled by Contractor(s) working on the projects, with no additional cost to the Owner.

END OF SECTION
SECTION 01-4000
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Testing and inspection agencies and services.
   B. Control of installation.
   C. Manufacturers’ field services.
   D. Defect Assessment.

1.02 RELATED REQUIREMENTS
   A. Section 01-3000 - Administrative Requirements: Submittal procedures.

1.03 SUBMITTALS
   A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
   B. Manufacturer’s Instructions: When specified in individual specification sections, submit printed
      instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the
      Owner’s information. Indicate special procedures, perimeter conditions requiring special
      attention, and special environmental criteria required for application or installation.
   C. Manufacturer’s Field Reports: Submit reports for Architect’s / Project Coordinator’s benefit as
      contract administrator or for Owner.
      1. Submit for information for the limited purpose of assessing conformance with information
         given and the design concept expressed in the contract documents.

1.04 REFERENCES AND STANDARDS
   A. For products and workmanship specified by reference to a document or documents not
      included in the Contract Documents, also referred to as reference standards, comply with
      requirements of the standard, except when more rigid requirements are specified or are
      required by applicable codes.
   B. Conform to reference standard of date of issue current on date of Contract Documents, except
      where a specific date is established by applicable code.
   C. Obtain copies of standards where required by product specification sections.
   D. Maintain copy at project site during submittals, planning, and progress of the specific work, until
      Substantial Completion.
   E. Should specified reference standards conflict with Contract Documents, request clarification
      from Architect / Project Coordinator before proceeding.
   F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor
      those of Architect / Project Coordinator shall be altered from the Contract Documents by
      mention or inference otherwise in any reference document.

1.05 TESTING AND INSPECTION AGENCIES AND SERVICES
   A. Owner will employ and pay for services of an independent testing agency to perform specified
      testing.
   B. Employment of agency in no way relieves Contractor of obligation to perform Work in
      accordance with requirements of Contract Documents.
PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect / Project Coordinator before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have Work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 TESTING AND INSPECTION

A. Testing Agency Duties:
   1. Provide qualified personnel at site. Cooperate with Architect / Project Coordinator and Contractor in performance of services.
   2. Perform specified sampling and testing of products in accordance with specified standards.
   3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   4. Promptly notify Architect / Project Coordinator and Contractor of observed irregularities or non-conformance of Work or products.
   5. Perform additional tests and inspections required by Architect.
   6. Submit reports of all tests/inspections specified.

B. Limits on Testing/Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the Work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the Work.

C. Contractor Responsibilities:
   1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
   2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
   3. Provide incidental labor and facilities:
      a. To provide access to Work to be tested/inspected.
      b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
      c. To facilitate tests/inspections.
      d. To provide storage and curing of test samples.
   4. Notify Architect / Project Coordinator and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
   5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

D. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect / Project Coordinator.

E. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.

3.03 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.04 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not conforming to specified requirements.

PART 4 – PAYMENT

4.01 MEASUREMENT AND PAYMENT

A. No separate measurement and/or payment will be made for any/all work and items specified or required by this Section. All requirements of this Section are considered incidental to the project and shall be fulfilled by Contractor(s) working on the projects, with no additional cost to the Owner.

END OF SECTION
SECTION 01-4523
COMPACTION TESTING

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Retaining and paying all costs an independent certified testing agency to take samples, perform moisture content, gradation, compaction density test during placement of backfill, embankments, engineered fills, subgrades, aggregate base courses and asphaltic concrete pavement.

1.02 QUALITY ASSURANCES
A. Independent testing agency shall be qualified in accordance with ASTM E 329.
B. Testing agencies:
   1. PSI Testing; 545 Conger Street; Eugene, Oregon.
   2. Northwest Testing Laboratories; 3395 - 34th Street NE; Salem, Oregon.
   3. Foundation Engineering; 5030 SW Philomath Blvd., Corvallis, Oregon.
   4. Braun Intertec Northwest, Inc.; 5405 North Lagoon Avenue, Portland, Oregon.
   5. Century West Engineering Corp.; 825 NE Multnomah, Suite 425; Portland, Oregon.
   6. Western Testing, Inc., 151 N 8th St., Coos Bay, Oregon.
   7. SHN Consulting Engineers & Geologists, Inc., 275 E Market Ave, Coos Bay, Oregon.
   8. Or other certified private testing laboratory approved by Engineer.
C. Testing agency will conduct compaction testing, recommend methods of compaction, and issue final report to the Owner, through Project Coordinator, on compaction test results and material compliance with specifications.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 GENERAL
A. Compaction testing shall be performed on soils and fill materials in trench and excavation backfills and prepared subgrades, and asphalt concrete pavements to verify and document the obtained relative in-place compaction.
B. No additional compensation will be made for down time incurred as a result of testing or waiting for test results.

3.02 TEST LOCATION SELECTION
A. Compaction testing shall proceed within a short distance behind the construction.
B. Compaction tests shall be performed at least once for each lift of material for each 100 lineal feet of trench or each 300 square feet of area, and once for each lift under manholes, catch basins, or other similar small structures.
C. Testing agency shall perform compaction tests at such locations and elevations as will be representative of the entire backfill or other material to be compacted. Within State or County right-of-ways the final decision as to the location and frequency of testing shall reside with the State’s or County’s authorized representative and Engineer. Within City right-of-ways, the Owner and Project Coordinator will make the final decision.

3.03 FAILED TESTS
A. Areas showing failing compaction results shall receive further attention without undue delay. Further attention may involve additional compaction effort, different compaction method, or removal and replacement of material as required to obtain passing results.
B. All failing test costs will be borne entirely by the Contractor and payments will not occur for failed tests. All associated costs arising from any necessary work due to failing compaction test results, including removal and replacement of material, shall be borne by the Contractor.

PART 4 - PAYMENT

4.01 MEASUREMENT AND PAYMENT

A. Measurement and payment for successful tests shall be paid on a unit price basis as shown in the Bid Form. Payment shall include all costs incidental to the compaction testing.

B. For payment, Contractor must submit invoice from Testing Agency clearly identifying project, location and date of testing, material tested, test method, test results, specified compaction results required, and number of tests taken. Only tests that have been directed and have passed will receive compensation.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary utilities.
B. Temporary Controls: Barriers, enclosures, and fencing.
C. Security requirements.
D. Vehicular access and parking.
E. Waste removal facilities and services.

1.02 REQUIREMENTS OF REGULATORY AGENCIES

A. Comply with all applicable codes, ordinances and laws. Pay all permits and fees required for temporary facilities and controls.

1.03 TEMPORARY UTILITIES

A. Temporary Lights and Power:
   1. Furnish adequate lights and power for safe working conditions, as required by O.S.H.A. or other applicable regulatory agencies.
   2. Temporary power shall be supplied by the Contractor. All appurtenances required by work of this contract to be provided by Contractor.
   3. Each Contractor shall provide extension cords and lamps as necessary for the work under his contract, and shall provide his own connections to and extensions from the power source.
B. Telephone:
   1. Maintain non coin box telephone with FAX capability. (Cell phone is acceptable.) Coordinate with SHMC / Project Coordinator office for Fax service.
   2. Notify SHMC / Project Coordinator of number.
   3. Install when work is started; maintain on job site until completion.
C. Temporary Toilets:
   1. Contractor responsible to meet all State and Local requirements for sanitary facilities.
   2. Contractor to provide Sanican for Contractor and Subcontractor use.
D. Water:
   1. Drinking Water: Provide from a proven safe drinking source for all those connected with the work; serve in single service containers, or other approved source.
   2. Construction Water: Water is available at the site.
   3. All water used until substantial completion paid for by SHMC, contractor required to connect and provide temporary water facilities.
E. Provide and pay for all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes.
F. Existing facilities may not be used, unless approved by the Owner.
G. Use trigger-operated nozzles for water hoses, to avoid waste of water.

1.04 CONSTRUCTION AIDS

A. Provide all necessary construction aids, including, but not limited to ladders, ramps, hoists, runways, etc.
B. Contractor shall be responsible for all such apparatus, equipment and construction meeting the requirements of labor and State and local laws.
1.05 BARRIERS
A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public and to protect existing facilities and adjacent properties from damage from construction operations.
B. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.
C. Project Limits Barricade: At Contractor's option.

1.06 VEHICULAR ACCESS AND PARKING
A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.
B. Coordinate access and haul routes with governing authorities and Owner.
C. Provide and maintain access to fire hydrants, free of obstructions.
D. Provide means of removing mud from vehicle wheels before entering streets.
E. Designated existing on-site roads may be used for construction traffic.
F. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

1.07 SPECIAL CONTROLS
A. Noise Control: The Contractor shall prevent all unnecessary noise from his operations and those from his employees and subcontractors.
B. Dust Control: During the entire period of construction, the Contractor shall exercise all reasonable and necessary means to abate dust. Necessary sprinkling and wetting shall be performed so that the site will not become excessively dusty at any time and the amount of dust carried in the air will be kept to a minimum.
C. Water Control: Perform pumping, trenching, damming, and under draining necessary to keep site free from water during construction. Dispose of water in a manner acceptable to local regulation, taking care that no existing water disposal facilities are impeded, clogged, damaged, or interfered with in any way.
D. Rubbish and Debris: Allow no excess accumulation of non-reusable material at the job site. Dispose of accumulations of rubbish and debris in a satisfactory manner, in accordance with the rules and regulations of the pollution control agencies having jurisdiction.
E. Protection of Existing Improvements:
   1. The Contractor is hereby cautioned and notified that he is responsible for the protection of existing improvements which are to remain in place, throughout the execution of this contract. Temporary enclosures, walls, covers, or other protection shall be provided and maintained.
   2. The Contractor shall be solely and directly responsible for any damage, injury, expense, loss, inconvenience, delay, suits, actions, or claims of any character brought because of any injuries or damages which result from carrying out the work to be done under the contract.
F. Fire Protection: The Contractor shall perform all work in a fire-safe manner.
   1. Protect hazardous materials, rubbish, and flammable materials.
   2. Provide ABC-type fire extinguishers of adequate quantity, readily available and properly maintained as required by applicable local, State, and Federal fire prevention regulations.
   3. Each field office, storage building, if any, and all internal combustion engine-driven piece of equipment shall be equipped with a fire extinguisher in accordance with the National Fire Protection Association (NFPA) guidelines.

1.08 RESTORATION OF EXISTING IMPROVEMENTS:
A. Restoration of Damage: Except as shown on the plans or as provided elsewhere in these specifications, the Contractor shall at his expense repair or replace curbs, sidewalks,
driveways, utilities, street surfaces, plant materials, and any and all structures and substructures damaged by his operations. These repairs and replacements shall be similar and equal in every respect to those now in place, and acceptable to SHMC.

B. Restoration of Services: In the event of interruption to any utility services as a result of the Contractor's operations, the Contractor shall promptly notify the proper authority. He shall cooperate with said authority in restoration of service as promptly as possible, and shall bear all costs of repair. In no case shall interruption of any utility service be allowed to exist outside working hours unless prior approval is received.

1.09 FIELD OFFICES
A. Office: Weathertight, with lighting, electrical outlets, heating, equipment, and equipped with sturdy furniture, drawing rack and drawing display table.
B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.
C. Locate offices a minimum distance of 30 feet from existing and new structures.

1.10 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS
A. Maintain all temporary utilities and facilities as long as needed for the safe and proper completion of the work.
B. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion inspection.
C. Clean and repair damage caused by installation or use of temporary work.
D. Restore existing facilities used during construction to original condition.

PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED
PART 4 – PAYMENT

4.01 MEASUREMENT AND PAYMENT
A. No separate measurement and/or payment will be made for any/all work and items specified or required by this Section. All requirements of this Section are considered incidental to the project and shall be fulfilled by Contractor(s) working on the project, with no additional cost to the Owner.

END OF SECTION
PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Preparatory work and operations necessary to become ready to perform the Work or item of Work.

PART 2 - MATERIALS - NOT USED

PART 3 - EXECUTION

3.01 GENERAL

A. Mobilization includes, but is not limited to the following:
   1. Move personnel, equipment, supplies and incidentals to and from the project site.
   2. Establish offices, buildings and other facilities necessary for work on the project.
   3. Premiums on bonds and insurance.
   4. Perform other work and operations or incurred cost as necessary before beginning work on the project.

B. Set up necessary construction facilities in a neat and orderly manner.

PART 4 - PAYMENT

4.01 Payment for Mobilization will be based upon the lump sum amount stated in the Contractors Bid Form.

A. The amounts paid for mobilization in the contract progress payment will be based on the percent of the original Contract amount that is earned from other Bid Form items, not including advances on materials, and as follows:
   1. When 5% is earned, either 50% of the amount for mobilization or 5% of the original Contract amount, whichever is the least.
   2. When 10% is earned, either 100% of mobilization or 10% of the original Contract amount, whichever is the least.
   3. When all work is completed, amount of mobilization exceeding 10% of the original Contract amount.

B. This schedule of mobilization progress payments will not limit or preclude progress payments otherwise provided by the Contract.
SECTION 01-5713
TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Prevention of erosion due to construction activities.
B. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.
C. Restoration of areas eroded due to insufficient preventive measures.
D. Compensation of Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.
E. Requirements of NPDES 1200-C Erosion and Sediment Control Permit issued by Oregon DEQ.

1.02 RELATED REQUIREMENTS
A. Section 31-1000 - Site Clearing: Limits on clearing; disposition of vegetative clearing debris.
B. Section 31-2200 - Grading: Temporary and permanent grade changes for erosion control.

1.03 REFERENCE STANDARDS
A. EPA (NPDES) - National Pollutant Discharge Elimination System (NPDES), Construction General Permit; Current Edition.

1.04 PERFORMANCE REQUIREMENTS
A. Comply with all requirements of U.S. Environmental Protection Agency for erosion and sedimentation control, as specified for the National Pollutant Discharge Elimination System (NPDES), Phases I and II, under requirements for the 2003 Construction General Permit (CGP), whether the project is required by law to comply or not.
1. Owner to secure NPDES 1200-C Oregon DEQ Permit and pay all associated fees.
   a. Permit shall remain in effect until project completion (all phases).
   b. Contractor is responsible for continual permit compliance until project completion (all phases).
2. Contractor shall follow all requirements set forth by DEQ, including, but not limited, to the following:
   a. Full-time inspection and visual monitoring reports.
   b. Continuous Erosion and Sediment Control Plan drawing updates throughout project duration.
      i. ESC drawings are found with Drawings for reference and basis of continual compliance.
      ii. All changes to Permit Drawings must be submitted to Project Coordinator and DEQ.
B. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.
C. Timing: Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.
D. Storm Water Runoff: Control increased storm water runoff due to disturbance of surface cover due to construction activities for this project.
1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.
2. Anticipate runoff volume due to the most extreme short term and 24-hour rainfall events that might occur in 25 years.

E. Erosion On Site: Minimize wind, water, and vehicular erosion of soil on project site due to construction activities for this project.
   1. Control movement of sediment and soil from temporary stockpiles of soil.
   2. Prevent development of ruts due to equipment and vehicular traffic.
   3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.

F. Erosion Off Site: Prevent erosion of soil and deposition of sediment on other properties caused by water leaving the project site due to construction activities for this project.
   1. Prevent windblown soil from leaving the project site.
   2. Prevent tracking of mud onto public roads outside site.
   3. Prevent mud and sediment from flowing onto sidewalks and pavements.
   4. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.

G. Sedimentation of Waterways On Site: Prevent sedimentation of waterways on the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
   1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
   2. If sediment basins are used as temporary preventive measures, pump dry and remove deposited sediment after each storm.

H. Sedimentation of Waterways Off Site: Prevent sedimentation of waterways off the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
   1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.

I. Open Water: Prevent standing water that could become stagnant.

J. Maintenance: Maintain temporary preventive measures until permanent measures have been established.

1.05 SUBMITTALS

A. See Section 01-3000 - Administrative Requirements, for submittal procedures.

B. Contractor to update Erosion and Sedimentation Control Plan and Schedule as required by permitting agency.
   1. Contractor shall submit copies of any changes made to Erosion and Sedimentation Control Plan and Schedule throughout duration of project.
   2. Include:
      a. Schedule of temporary preventive measures, in relation to ground disturbing activities.

C. Certificates:
   1. Mill certificate for silt fence fabric attesting that fabric and factory seams comply with specified requirements, signed by legally authorized official of manufacturer; indicate actual minimum average roll values; identify fabric by roll identification numbers.

D. Inspection Reports - actual reports performed and furnished by others:
   1. Contractor to submit name, certification number and contact information for person responsible for ESC inspections per permitting agency requirements.
2. Submit report of each inspection:
   a. Identify each preventative measure.
   b. Indicate condition of site and preventative measures.
   c. Specify maintenance or repair required and accomplished.
   d. Any other requirements as directed by permitting agency.

E. Maintenance Instructions: Provide instructions covering inspection and maintenance for temporary measures that must remain after Substantial Completion.

PART 2 PRODUCTS

2.01 MATERIALS

A. All materials shall be submitted for approval prior to installation.

B. Mulch: Protective layer of straw or other suitable mulch material to the soil surface. Mulch shall be free of all weed or plant seeds and contain no substances detrimental to plant life.
   1. Cellulose mulch, produced from virgin wood or straw, processed so the fibers remain uniformly suspended under agitation in water. The fibers shall have moisture-absorption and percolation properties.
      a. Straw mulch used for non-hydroseeding applications shall be from bent grass, bluegrass, fescue or other rye grass singly or in combination. Straw shall not be moldy, caked, decayed, or of otherwise low quality.
   2. Provide certification that the mulch material is free of noxious weed seeds or plant parts.

C. Seed for Permanent Cover: Section 32-9200 - Seeding.

D. Silt Fence Fabric: Polypropylene geotextile resistant to common soil chemicals, mildew, and insects; non-biodegradable; in longest lengths possible; fabric including seams with the following minimum average roll lengths:
   1. Average Opening Size: 30 U.S. Std. Sieve, maximum, when tested in accordance with ASTM D4751.
   2. Permittivity: 0.05 sec^-1, minimum, when tested in accordance with ASTM D4491.
   3. Ultraviolet Resistance: Retaining at least 70 percent of tensile strength, when tested in accordance with ASTM D4355/D4355M after 500 hours exposure.
   4. Tensile Strength: 100 pounds-force, minimum, in cross-machine direction; 124 pounds-force, minimum, in machine direction; when tested in accordance with ASTM D4632/D4632M.
   5. Elongation: 15 to 30 percent, when tested in accordance with ASTM D4632/D4632M.
   6. Tear Strength: 55 pounds-force, minimum, when tested in accordance with ASTM D4533.
   7. Color: Manufacturer’s standard, with embedment and fastener lines preprinted.

E. Silt Fence Posts: One of the following, minimum 5 feet long:
   1. Steel U- or T-section, with minimum mass of 1.33 pound per linear foot.
   2. Hardwood, 2 by 2 inches in cross section.

F. Wattles: Biodegradable Straw Wattle:
   1. Sedimax-SWB9 (Straw Wattle Biodegradable 9 inch) by Tensar International Corporation; www.tensacorp.com; Telephone number: 1-800-TENSAR-1 or approved equal.
      a. The wattle shall be composed of agricultural straw and be wrapped in biodegradable tubular organic, woven jute net.
      b. The netting weight shall be approximately 1.28 ounces/linear ft. and shall be made from a woven, lightweight woven jute netting. The netting shall have aperture openings measuring 0.50 x 1.0 inches.
      c. The wattle ends will be secured with wire closures.
      d. Material Content:
1) Matrix: 100 percent straw fiber; 2.88 lbs/linear ft.
2) Netting: Tubular, diamond-shaped netting; 1.28 oz/linear ft.
3) Wire Closure: Industrial grade ring wire, 18 guage; 3.75 inch.

e. Physical Specifications:
1) Width: 9.00 inch.
2) Length: 25.00 ft.
3) Weight +/- 10 percent: 57 lbs.

G. Biofilter Bags: Plastic mesh bags filled with clean 100% recycled wood waste.
   1. Locations: as needed.

H. Gravel: See Section 32-1123 for aggregate.
I. Traffic Bearing Aggregate Surface. See Section 31-2323 - Fill.
J. Riprap: See Section 31-3700.
K. Concrete Washout System.
   1. Provide containment, removal and disposal of concrete waste and concrete wash water by furnishing, maintaining and removing temporary concrete washout bins.
   2. Location:
      a. Keep washout area at least 50 feet from streets, storm drains, open drainage areas and streams.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.02 PREPARATION
   A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

3.03 SCOPE OF PREVENTIVE MEASURES
   A. In all cases, if permanent erosion resistant measures have been installed temporary preventive measures are not required.

B. Construction Entrances: Traffic-bearing aggregate surface.
   1. Width: As required; 20 feet, minimum.
   2. Length: 50 feet, minimum.
   3. Provide at each construction entrance from public right-of-way.
   4. Where necessary to prevent tracking of mud onto right-of-way, provide wheel washing area out of direct traffic lane, with drain into sediment trap or basin.

C. Linear Sediment Barriers: Made of silt fences.
   1. Provide linear sediment barriers:
      a. Along downhill perimeter edge of disturbed areas, including soil stockpiles.
   2. Space sediment barriers with the following maximum slope length upslope from barrier:
      a. Slope of Less Than 2 Percent: 100 feet.
      b. Slope Between 2 and 5 Percent: 75 feet.
      c. Slope Between 5 and 10 Percent: 50 feet.
      d. Slope Between 10 and 20 Percent: 25 feet.
      e. Slope Over 20 Percent: 15 feet.

D. Storm Drain Curb Inlet Sediment Trap: Protect each curb inlet using one of the following measures:
   1. Filter fabric wrapped around hollow concrete blocks blocking entire inlet face area; use one piece of fabric wrapped at least 1-1/2 times around concrete blocks and secured to prevent dislodging; orient cores of blocks so runoff passes into inlet.
   2. Straw bale row blocking entire inlet face area; anchor into pavement.
E. Storm Drain Drop Inlet Sediment Traps: As detailed on drawings.

F. Temporary Splash Pads: Stone aggregate over filter fabric; size to suit application; provide at downspout outlets and storm water outlets.

G. Soil Stockpiles: Protect using one of the following measures:
   1. Cover with polyethylene film, secured by placing soil on outer edges.
   2. Cover with mulch at least 4 inches thickness of pine needles, sawdust, bark, wood chips, or shredded leaves, or 6 inches of straw or hay.

H. Mulching: Use only for areas that may be subjected to erosion for less than 6 months.

I. Seeding: Use where temporary vegetated cover is required. See Section 32-9200 – Seeding.

3.04 MAINTENANCE
   A. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches or more rainfall at the project site, and daily during prolonged rainfall.
   B. Repair deficiencies immediately.
   C. Clean out temporary sediment control structures weekly and relocate soil on site.
   D. Place sediment in appropriate locations on site; do not remove from site.

3.05 CLEAN UP
   A. Remove temporary measures after permanent measures have been installed, unless permitted to remain by SHMC / Project Coordinator.
   B. Clean out temporary sediment control structures that are to remain as permanent measures.
   C. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

PART 4 – PAYMENT

4.01 MEASUREMENT AND PAYMENT
   A. Payment shall be on a lump sum basis. Payment shall include providing labor, materials, and equipment required to install, monitor, and maintain effective functioning erosion control devices throughout the duration of the project, including possible periods of inactivity during “wet” season, as needed for permit compliance during construction.
   B. Payments shall also include restoration of all disturbed ground, including grass seeding all areas of bare soil unless noted otherwise on Drawings.

END OF SECTION
SECTION 01-6000
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. General product requirements.
   B. Transportation, handling, storage and protection.
   C. Delivery and Inspection
   D. Product option requirements.
   E. Substitution limitations and procedures.
   F. Storage
   G. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS
   A. Document 00-2113 - Instructions to Bidders: Product options and substitution procedures prior to bid date.
   B. Section 01-1000 - Summary - Lists of products to be removed from existing building.
   C. Section 01-3000 - Administrative Requirements.
   D. Section 01-4000 - Quality Requirements.
   F. Section 01-7419 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting packaging and substitutions.

1.03 SUBMITTALS
   A. Product Data Submittals: Submit manufacturer’s standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers’ standard data to provide information specific to this Project.
   B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
   C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
      1. For selection from standard finishes, submit samples of the full range of the manufacturer’s standard colors, textures, and patterns.

PART 2 PRODUCTS

2.01 NUMBER OF ITEMS SPECIFIED:
   A. Wherever in these specifications an article, device, or equipment is referred to in the singular number, such reference shall apply to as many such articles as are shown on the Drawings or are required to complete the installations.

2.02 CONFORMANCE WITH SPECIFIED PRODUCT DESCRIPTIONS
   A. Conform to applicable Specifications and Reference Standards.
   B. Furnish all materials of a kind by one manufacturer, except component parts of an assembly need not be the product of a single manufacturer unless otherwise indicated.
   C. Furnish all items new and free from defects, of size, type, and quality specified.
   D. Refer to Section 01-6000 – Product Requirements for requirements concerning proprietary specifications and product options.
   E. Items shown on the drawings, but not otherwise described or noted, shall be provided in conformance with applicable code requirements.
2.03 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by the Contract Documents.

2.04 PRODUCT OPTIONS

A. Definition of Descriptive Specification: For the purposes of this Contract, Descriptive Specification shall mean one or more listed requirements describing a Product, or reference to Standard Specifications or Standards issued by a named Agency, Manufacturer or similar Organization.

B. For Products specified only by Descriptive Specifications, select any product meeting specified requirements.

C. For Products specified by listing proprietary names of Products:
   1. If no Descriptive Specification is included, select any named Product.
   2. If descriptive specification is included it shall take precedence. Contractor shall verify with supplier that the named Product may be provided to meet the requirements of the descriptive specification including requirements in addition to named manufacturers regular standards. If Product cannot be provided to meet the specifications, notify Project Coordinator/SHMC at least (5) five days prior to Bid Opening, or prior to execution of the Agreement if the Project is negotiated. Failure to deliver such notice within the specified time limit shall for the purposes of this Contract establish that the Contractor has made the required verifications, and he shall be responsible either to provide the Product as specified, or to provide an approved substitute Product at no additional cost to Salmon Harbor Management Committee.
   3. Materials or Products specified by name of manufacturer shall establish a standard of quality and shall not be construed as limiting competition. The Contractor may use other materials or products only as approved in writing by Project Coordinator/SHMC.

D. Items shown on the drawings, but not otherwise described or noted, shall be provided in conformance with applicable code requirements.

2.05 SUBSTITUTIONS

A. Submit requests for substitution approvals in triplicate and include complete data substantiating compliance of proposed substitution with Contract Documents as follows:
   1. Identity of product for which substitution is requested, including specification page and paragraph.
   2. Identity of proposed substitution, including drawings, photographs, performance and test data, and any other information necessary for evaluation.
   3. Quality comparison of proposed substitution with specified product.
   4. Changes required in other Work because of substitution.
   5. Effect on Construction progress schedule.
   6. Cost comparison of proposed substitution with specified product.
   7. Any required license fees or royalties.
   8. Availability of maintenance service.

B. In making request for substitution, Manufacturer/Contractor represents:
   1. Contractor has personally investigated proposed Product, and determined that it is equal to or superior in all respects to that specified.
   2. Contractor will provide the same guarantee for substitutions as for product specified.
   3. Contractor will coordinate installation of proposed substitution into Work, making such changes as may be required for the Work to be complete in all respects.
   4. Contractor waives all claims for additional costs related to substitution which consequently become apparent.
   5. Data submitted with substitution request is complete and accurate.

C. Substitutions will not be considered if:
   1. They are indicated or implied on shop drawings or project data submittals without formal request for substitution as described herein above.
2. Acceptance will require substantial revision of the Contract Documents.
3. Salmon Harbor Management Committee does not agree that the proposed substitution is in their best interest.

2.06 MAINTENANCE MATERIALS
   A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
   B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION PROCEDURES
   A. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.
   B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
   C. A request for substitution constitutes a representation that the submitter:
      1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
      2. Will provide the same warranty for the substitution as for the specified product.
      3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
      4. Waives claims for additional costs or time extension that may subsequently become apparent.
   D. Substitution Submittal Procedure:
      1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
      2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
      3. The Architect will notify Contractor in writing of decision to accept or reject request.

3.02 TRANSPORTATION AND HANDLING
   A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
   B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
   C. Timing: Arrange Product deliveries in accord with Construction Progress; coordinate with SHMC to avoid conflict with Work and site conditions.
   D. Transport and handle products in accordance with manufacturer's instructions.
   E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
   F. Delivery and inspection: Deliver Products undamaged, in Manufacturer’s original containers or packaging, and with legible identifying labels intact. Immediately upon delivery, inspect shipments to assure that Products are properly protected and undamaged.
   G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
   H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.03 STORAGE AND PROTECTION
   A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.
   B. Store and protect products in accordance with manufacturers' instructions.
C. Store with seals and labels intact and legible.
D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
E. For exterior storage of fabricated products, place on sloped supports above ground.
F. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
G. Comply with manufacturer's warranty conditions, if any.
H. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
I. Prevent contact with material that may cause corrosion, discoloration, or staining.
J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.
L. Protection after Installation: Provide substantial coverings as necessary to protect installed Products against damage. Remove covering when no longer needed.

3.04 INAPPROPRIATE PRODUCTS AND METHODS:
A. Should any materials be found to be contrary to the Contract, the material no matter in what stage of completion, may be rejected by Project Coordinator/SHMC and if rejected shall be removed from the site at once.
B. If the Contractor believes that any specified product, method, or system is inappropriate for use, or any specified result cannot be achieved, he shall so notify Project Coordinator/SHMC at least (7) seven days prior to Bid opening, or prior to execution of the Agreement if the project is not bid. Failure to deliver such notice of objection within the specified time limit, shall for the purposes of this Contract, establish that the Contractor agrees that the specified products, methods, or systems are appropriate, and achievable, and the Contractor's responsibility to provide and warrant such product, method, or system shall not later be voided or reduced. If after the agreement is signed, the Contractor notifies Project Coordinator/SHMC that a specified result, product, or system cannot be provided, then it shall be the Contractor's responsibility to provide a substitute which is acceptable to Project Coordinator/SHMC.

3.05 PREPARATION AND INSPECTION
A. No Product shall be applied or installed until conditions and surfaces are acceptable to Applicator or Installer.
B. Notify Project Coordinator/SHMC of unacceptable condition or surfaces.
C. Failure to notify Project Coordinator/SHMC of unsatisfactory condition or subsurface before Work is started shall place full responsibility for final results upon the installer or applicator.
D. Prior to covering, concealing or otherwise affecting the Work of other trades, verify with Project Coordinator/SHMC that the Work of the other trade is complete and may be so concealed, covered, or affected. Failure to make such verification shall cause Contractor to assume complete responsibility for any necessary corrective measures.

3.06 MANUFACTURER'S INSTRUCTIONS:
A. Perform Work in accordance with manufacturer's instructions. Do not omit preparatory or installation procedures required by Manufacturer, unless specifically modified or exempted by Contract Documents.
B. When Contract Documents require Work to comply with Manufacturer's instructions, obtain and distribute such instructions to parties performing Work, and if requested, include copy to Project Coordinator/SHMC.
1. Maintain one copy of Manufacturer's instructions at job site during installation and until acceptance.
C. Handle, install, connect, clean, condition, and adjust Products in strict accordance with Manufacturer's instructions and in conformance with specified requirements.
D. Should job conditions or specified requirements conflict with Manufacturer's instructions, consult Project Coordinator/SHMC for further instructions. Do not proceed with Work without clear instructions.

PART 4 PAYMENT
4.01 MEASUREMENT AND PAYMENT
A. No separate measurement and/or payment will be made for any/all work and items specified or required by this Section. All requirements of this Section are considered incidental to the project and shall be fulfilled by Contractor(s) working on the project, with no additional cost to the Owner.
SECTION 01-7000
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Examination, preparation, and general installation procedures.
B. Pre-installation meetings.
C. Cleaning and protection.
D. Starting of systems and equipment.
E. Demonstration and instruction of Owner personnel.
F. Closeout procedures, except payment procedures.

1.02 RELATED REQUIREMENTS
A. Section 01-1000 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.
B. Section 01-3000 - Administrative Requirements: Submittals procedures.
C. Section 01-7419 - Construction Waste Management and Disposal: Additional procedures for trash/waste removal, recycling, salvage, and reuse.
D. Section 01-7800 - Closeout Submittals: Project record documents, operation and maintenance data, warranties and bonds.

1.03 SUBMITTALS
A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
   1. On request, submit documentation verifying accuracy of survey work.
   2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in conformance with Contract Documents.
   3. Submit surveys and survey logs for the project record.
C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.

1.04 QUALIFICATIONS
A. For survey work, employ a land surveyor registered in the State in which the Project is located and acceptable to Project Coordinator. Submit evidence of Surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate.

1.05 PROJECT CONDITIONS
A. Use of explosives is not permitted.
B. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.06 COORDINATION
A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements.
B. Notify affected utility companies and comply with their requirements.
C. Coordinate completion and clean-up of work of separate sections.
PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01-6000.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
C. Examine and verify specific conditions described in individual specification sections.
D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
E. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.
B. Seal cracks or openings of substrate prior to applying next material or substance.
C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.
B. Require attendance of parties directly affecting, or affected by, work of the specific section.
C. Notify Project Coordinator four days in advance of meeting date.
D. Prepare agenda and preside at meeting:
   1. Review conditions of examination, preparation and installation procedures.
   2. Review coordination with related work.
E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect/Project Coordinator, Owner, participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.
B. Promptly notify Project Coordinator of any discrepancies discovered.
C. Contractor shall locate and protect survey control and reference points.
D. Control datum for survey is that indicated on drawings.
E. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
F. Promptly report to Project Coordinator the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
G. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Project Coordinator.

H. Utilize recognized engineering survey practices.

I. Establish a minimum of two permanent bench marks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.

J. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
   2. Grid or axis for structures.
   3. Building foundation, column locations, ground floor elevations.
   4. Controlling lines and levels required for mechanical and electrical trades.

K. Periodically verify layouts by same means.

L. Maintain a complete and accurate log of control and survey work as it progresses.

3.05 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer’s instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.
   3. Provide openings for penetration of mechanical, electrical, and other services.
   4. Match work that has been cut to adjacent work.
   5. Repair areas adjacent to cuts to required condition.
   6. Repair new work damaged by subsequent work.
   7. Remove samples of installed work for testing when requested.
   8. Remove and replace defective and non-conforming work.

C. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing.

D. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

E. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

F. Restore work with new products in accordance with requirements of Contract Documents.

G. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

H. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material, to full thickness of the penetrated element.

I. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
EXECUTION AND CLOSEOUT REQUIREMENTS
01-7000 - Page 4

3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.07 PROGRESS CLEANING
A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
D. Collect and remove waste materials, debris, and trash/rubbish from site weekly and dispose off-site; do not burn or bury.

3.08 PROTECTION OF INSTALLED WORK
A. Protect installed work from damage by construction operations.
B. Provide special protection where specified in individual specification sections.
C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
G. Prohibit traffic from landscaped areas.
H. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

3.09 SYSTEM STARTUP
A. Coordinate schedule for start-up of various equipment and systems.
B. Notify Project Coordinator and Owner seven days prior to start-up of each item.
C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
E. Verify that wiring and support components for equipment are complete and tested.
F. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
H. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.10 DEMONSTRATION AND INSTRUCTION
A. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.
B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
C. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of Owner’s personnel.

3.11 ADJUSTING
A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.12 INSTRUCTION OF SALMON HARBOR MANAGEMENT COMMITTEE’S PERSONNEL
A. Prior to final acceptance, provide instruction to SHMC’s Personnel in necessary operation, adjustment, and maintenance of Products, Equipment, and Systems.
B. Operating and Maintenance Manual shall constitute basis of instruction.
C. Review manual with SHMC’s personnel in detail to explain all aspects of operations and maintenance.

3.13 FINAL CLEANING
A. Use cleaning materials that are nonhazardous.
   1. Use only those recommended by Manufacturer or surface to be cleaned.
   2. Use only on surfaces recommended by cleaning material manufacturer.
   3. Follow cleaning Material and Manufacturer’s instructions.
B. Clean exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces,
C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
E. Clean filters of operating equipment.
F. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, and drainage systems.
G. Clean site; sweep paved areas, rake clean landscaped surfaces.
H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.
I. Perform final cleaning prior to Occupancy or Final Completion, whichever of the two is earlier.
J. Employ skilled workmen for final cleaning.
K. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign matter from all exposed interior and exterior surfaces.
L. Clean and polish glass, mirrors, fixtures, hardware, resilient floor covering and other glossy surfaces.
M. Hose clean exterior paved surfaces; rake clean other surfaces of grounds, after removal of temporary facilities.
N. Ventilating System: Clean ducts, fans and heaters if units were operated during construction.
O. Remove rubbish dirt and extraneous materials from the interiors of conduits, catch basins, manholes, and other construction work.

3.14 CLOSEOUT PROCEDURES
A. Make submittals that are required by governing or other authorities.
B. SUBSTANTIAL COMPLETION
   1. When Contractor considers Work Substantially Complete, he shall submit to Project Coordinator/Project Coordinator/SHMC:
      a. Written notice that Work is Substantially Complete.
      b. List of items to be completed or corrected.
   2. Project Coordinator/SHMC will, as soon as possible after receipt of notice, inspect to verify completion status.
3. Should Project Coordinator/SHMC consider that Work is not Substantially Complete:
   a. Project Coordinator/SHMC will notify Contractor in writing, giving reasons therefore.
   b. Contractor shall remedy Work deficiencies, and send second notice of Substantial Completion to Project Coordinator/SHMC.
   c. Project Coordinator/SHMC will re-inspect Work.
4. When Project Coordinator concurs that Work is Substantially Complete, he will:
   a. Prepare Certificate of Substantial Completion accompanied with Contractor's list of items to be completed or corrected, as verified by Project Coordinator/SHMC.
   b. Submit Certificate to SHMC and Contractor for their written acceptance of the responsibilities assigned to them in the Certificate.

C. FINAL COMPLETION
1. When Contractor considers Work complete, he shall submit written certification that:
   a. Contract Documents have been reviewed.
   b. Contractor has inspected Work for compliance with Contract Documents.
   c. Work has been completed in accordance with the Contract Documents.
   d. Equipment and Systems have been tested in presence of SHMC's Representative and are operational.
   e. Work is complete and ready for final inspection.
2. Project Coordinator/SHMC will, as soon as possible after receipt of Contractor's Certification, inspect to verify completion status.
3. Should Project Coordinator/SHMC consider Work incomplete or defective:
   a. Project Coordinator/SHMC will notify Contractor in writing, listing incomplete or defective Work.
   b. Contractor shall immediately remedy deficiencies, and send second written certification to Project Coordinator/SHMC that Work is complete.
   c. Project Coordinator/SHMC will re-inspect Work.
4. When Project Coordinator/SHMC finds Work acceptable under Contract Documents, he shall request final closeout submittals.

D. Notify Project Coordinator and SHMC when work is considered ready for Substantial Completion.
E. Submit written certification that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Project Coordinator's and SHMC's review.
F. Owner will occupy all of the building as specified in Section 01-1000.
G. Conduct Substantial Completion inspection and create Final Correction Punch List containing Project Coordinator’s and Contractor’s comprehensive list of items identified to be completed or corrected and submit to Project Coordinator.
H. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.
I. Notify Project Coordinator when work is considered finally complete and ready for Project Coordinator's Substantial Completion final inspection.
J. Project Coordinator and SHMC will, as soon as possible after receipt of notice, inspect to verify completion status.
K. Substantial Completion:
L. Complete items of work determined by Project Coordinator listed in executed Certificate of Substantial Completion.
M. Should Project Coordinator/SHMC consider Work incomplete or defective:
   1. Project Coordinator/SHMC will notify Contractor in writing, listing incomplete or defective Work.
   2. Contractor shall immediately remedy deficiencies, and send second written certification to Project Coordinator/SHMC that Work is complete.
3. Project Coordinator/SHMC will re-inspect Work.
4. When Project Coordinator/SHMC finds Work acceptable under Contract Documents, he shall request final closeout submittals.

N. REINSPECTION FEES
1. Should Project Coordinator/SHMC be required to make more than two final inspections due to Contractor's failure to correct specified deficiencies, Project Coordinator/SHMC will deduct a compensation amount from Contractor's final payment as follows:
   2. SHMC time at $80.00 per hour.
   3. Others at 1.20 times the direct cost incurred.
   4. Charges will be made for necessary travel time, auto expense computed at 56 cents per mile, and all other expenses incurred in making inspections.

3.15 FINAL ADJUSTMENTS AND FINAL PAYMENT
   A. Project Coordinator/SHMC will prepare and issue final Change Order, reflecting approved adjustments to Contract Sum not previously made by Change Orders.
   B. Contractor shall follow procedures specified in Contract Conditions in making final application for payment.

PART 4 PAYMENT
4.01 MEASUREMENT AND PAYMENT
   A. No separate measurement and/or payment will be made for any/all work and items specified or required by this Section. All requirements of this Section are considered incidental to the project and shall be fulfilled by Contractor(s) working on the project, with no additional cost to the Owner.

END OF SECTION
SECTION 01-7419
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

A. Owner requires that this project generate the least amount of trash and waste possible.
B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.
C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.
D. Required Recycling, Salvage, and Reuse: The following may not be disposed of in landfills or by incineration:
   1. Aluminum and plastic beverage containers.
   2. Corrugated cardboard.
   3. Wood pallets.
   4. Clean dimensional wood: May be used as blocking or furring.
   5. Land clearing debris, including brush, branches, logs, and stumps; see Section 31-1000 - Site Clearing for use options.
   6. Metals, including packaging banding, metal studs, sheet metal, structural steel, piping, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
   7. Paint.
E. Methods of trash/waste disposal that are not acceptable are:
   1. Burning on the project site.
   2. Burying on the project site.
   3. Dumping or burying on other property, public or private.
   4. Other illegal dumping or burying.
   5. Incineration, either on- or off-site.
F. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 RELATED REQUIREMENTS

A. Section 01-5000 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.
B. Section 01-6000 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.
C. Section 01-7000 - Execution and Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

1.03 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.
B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.
C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.
D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.
E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

I. Return: To give back reusable items or unused products to vendors for credit.

J. Reuse: To reuse a construction waste material in some manner on the project site.

K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

N. Toxic: Poisonous to humans either immediately or after a long period of exposure.

O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 WASTE MANAGEMENT PROCEDURES

A. See Section 01-6000 for waste prevention requirements related to delivery, storage, and handling.

B. See Section 01-7000 for trash/waste prevention procedures related to cutting and patching, installation, protection, and cleaning.

3.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. Meetings: Discuss trash/waste management goals and issues at project meetings, particularly at:
   1. Pre-construction meeting.
   2. Regular job-site meetings.

B. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
   1. As a minimum, provide:
      a. Separate area for storage of materials to be reused on-site, such as wood cut-offs for blocking.
      b. Separate dumpsters for each category of recyclable.
      c. Recycling bins at worker lunch area.
   2. Provide containers as required.
   3. Provide adequate space for pick-up and delivery and convenience to subcontractors.
   4. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.

C. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.
D. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

E. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.

F. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

PART 4 PAYMENT
4.01 MEASUREMENT AND PAYMENT
A. No separate measurement and/or payment will be made for any/all work and items specified or required by this Section. All requirements of this Section are considered incidental to the project and shall be fulfilled by Contractor(s) working on the project, with no additional cost to the Owner.

END OF SECTION
SECTION 01-7800
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Project Record Documents.
   B. Operation and Maintenance Data.
   C. Warranties and bonds.
   D. Evidence of Payments and Release of Liens.

1.02 RELATED REQUIREMENTS
   A. SHMC General Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.
   B. Section 01-3000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
   C. Section 01-7000 - Execution and Closeout Requirements: Contract closeout procedures.
   D. Individual Product Sections: Specific requirements for operation and maintenance data.
   E. Individual Product Sections: Warranties required for specific products or Work.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS
   A. Maintain on site one set of the following record documents; record actual revisions to the Work:
      1. Drawings.
      3. Addenda.
      4. Field Orders.
      5. Change Orders and other modifications to the Contract.
      6. Reviewed shop drawings, product data, and samples.
      7. Field Test Reports.
      8. Manufacturer's instruction for assembly, installation, and adjusting.
      9. Other written instructions.

   B. Ensure entries are complete and accurate, enabling future reference by Owner.

   C. Store record documents separate from documents used for construction, and maintain in clean, dry, legible condition; available at all times for inspection by Project Coordinator/SHMC.

   D. Record information concurrent with construction progress; do not Conceal any Work until required information has been recorded. Lack of current Record Documents shall be grounds for withholding progress payments.

   E. Specifications and Addenda: Legibly mark and record at each product section description of actual products installed, including the following:
      1. Manufacturer, trade name, catalog number / product model and number, and Supplier for each Product actually installed.
      2. Product substitutions or alternates utilized.

   F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
      1. Measured depths of foundations in relation to finish floor elevation datum.
      2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
4. Field changes of dimension and detail.
5. Details not on original Contract drawings.
6. Contractor to submit clean set of Drawings, transferring all changes that occurred during construction from the working job set of Drawings to a clean set of Drawings. Submit to Architect for review and approval.

3.02 RECORDING
A. Documents shall be maintained by a competent draftsman. If Project Coordinator/SHMC considers submitted drafting to be unacceptable, redraft until acceptable at no additional cost to SHMC.
B. Label each Document "PROJECT RECORD" in 1" high printed letters.
C. Required Drawings:
   2. Prior to submittal, transfer recorded information to one additional blue-line print. Contractor may retain "work set" for his records.

3.03 SUBMITTALS
A. Project Record Documents: Submit documents to Architect/Project Coordinator with claim for final Application for Payment, accompanied by transmittal letter, containing:
   1. Project Title.
   2. Date.
   3. Contractor's name and address.
   4. Title and number of each Record Document.
   5. Signature of Contractor, or his authorized representative.
B. Operation and Maintenance Data:
   1. Data preparation shall be done by personnel:
      a. Completely familiar with the requirements of Operation and Maintenance Data.
      b. Trained and experienced in maintenance and operation of described products.
   2. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Project Coordinator will review draft and return one copy with comments.
   3. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
   4. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Project Coordinator comments. Revise content of all document sets as required prior to final submission.
   5. Submit two sets of revised final documents in final form within 10 days after final inspection.
C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.
D. All closeout submittals shall be made at one time to SHMC, except that extra materials shall be delivered at one time to the Project site, with letter of transmittal listing items to SHMC with verifying signature of receipt of SHMC's representative.
3.04 OPERATION AND MAINTENANCE DATA
   A. Compile full details for care and maintenance of materials, equipment, and systems, where specified herein or in other Specification Sections.
      1. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors or installers and suppliers, including local source of supplies, paint, and replacement parts, and recommended Maintenance Contractor, if needed.
      2. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
      3. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
      4. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
   B. Instruct SHMC's personnel in maintenance or Products and in operation of equipment and systems.

3.05 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES
   A. For Each Product, Applied Material, and Finish:
      1. Product data, with catalog number, size, composition, and color and texture designations.
   B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
   D. Additional information as specified in individual product specification sections.
   E. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.06 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS
   A. For Each Item of Equipment and Each System:
      1. Description of unit or system, and component parts.
      2. Identify function, normal operating characteristics, and limiting conditions.
      3. Include performance curves, with engineering data and tests.
      4. Complete nomenclature and model number of replaceable parts.
   B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
   C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
   D. Include color coded wiring diagrams as installed.
   E. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
   F. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
   G. Provide servicing and lubrication schedule, and list of lubricants required.
   H. Include manufacturer's printed operation and maintenance instructions.
   I. Include sequence of operation by controls manufacturer.
J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

K. Additional Requirements: As specified in individual product specification sections.

3.07 ADDITIONAL DATA

A. Prepare and include additional data:
   1. When need becomes apparent during instruction of SHMC's personnel.
   2. As specified in other Sections of the Specifications.

3.08 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

B. Where systems involve more than one specification section, provide separate tabbed divider for each system.

C. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

D. Prepare data in the form of an instructional manual.

E. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

F. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

G. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

H. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

I. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

J. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.

K. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

L. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Architect, Consultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.

3.09 WARRANTIES, BONDS, AND MAINTENANCE CONTRACTS

A. Obtain warranties, bonds, and maintenance contracts, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.

   1. The Contractor shall and hereby does warrant against ordinary wear and usage the following Work as noted, and for the following periods of time after the start of the Warranty Period as defined below (3.09.4):
      a. Warranties for Work and for periods of service as called for in the respective Sections of the Specifications, regardless of limitations or conditions written into any certificates of warranty or guarantee which might be submitted.
         1) 3 years: Applied finishes against delaminating from surface to which applied.
         2) 2 years: Effectiveness of soil sterilizers; Electrical work and equipment specified in Division 26.
b. The above warranties are an extension to run concurrently with the one-year statutory warranty, and are in addition to any Guarantee, Bond or warranties called for elsewhere in the Contract Documents.

2. General Warranties:
   a. Provide one-year warranty as described in the General Conditions, Article 33. Warranty period shall commence on the date of the fully executed Certificate of Substantial Completion.

3. Product Warranties:
   a. Warrant that the Product will be replaced or properly repaired, without delay and without cost to SHMC, should the Product fail to properly function or provide service within the specified warranty period.

4. Additional Warranties: See individual technical specification sections for written warranties for specific projects of work.

5. Warranty Period: shall begin upon Substantial Completion, or if a Certificate of Substantial completion is not issued, or if Work which is to be covered by warranty is not then complete, Warranty period shall begin upon the date of Final Acceptance or on the date appearing on the final Certificate for Payment to the Contractor, whichever is earlier. SHMC’s occupancy or use of the Project will not alter the Warranty Period herein defined.

6. Include instances which might affect validity of warranties, bonds, or contracts.

B. Verify that documents are in proper form, contain full information, and are notarized; duly signed by the installing Subcontractor, or representative of the Product Manufacturer.

C. Co-execute submittals when required.

D. Include proper procedures in event of failure.

E. Retain warranties, bonds, and maintenance contracts until time specified for submittal.

F. Warranty Submittals shall include:
   1. Project name and address
   2. Description of Product, and reference to Specification Section
   3. Length of Warranty as specified.
   4. Date of beginning for Warranty Period.
   5. Conditions of warranty as specified above.
   6. Additional conditions of warranty as required for Product by Specifications.
   7. Statement that the signatory agrees to provide said warranty.
   8. Typed Name of individual signing warranty, signature, and date.

G. Where extended Warranties or specific conditions of Warranty are called for in the respective Sections of the Specifications, but where no Certificate of Warranty is required to be submitted, the Contractor may, at his option, and to protect his own interests, require the respective Subcontractors or Suppliers to provide him with Certificates of Warranty covering his Warranty obligations to SHMC.


I. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.

J. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.

K. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
3.10 WARRANTY CONDITIONS

A. Should any Work covered by Warranty fail to properly function or to provide proper service within the Warranty period, the Contractor shall correct the defect immediately, at no cost to SHMC, following receipt of written notice from SHMC. Should any other damage be incurred, either as a direct result of the subject defect, or as a result of the Contractor’s failure to promptly correct the defect, then the Contractor shall also correct the resulting damage to SHMC’s satisfaction, at no additional cost, whether or not said damage is to Work provided under this contract. If delay in correction of a defect covered by warranty can reasonably be expected to create a risk of significant future damage, contingent expenses, or danger to persons or property, and if the Contractor does not act with promptness commensurate to such risk, or if SHMC cannot contact the Contractor after making a reasonable effort, then SHMC may at his option, have the defect corrected and the Contractor shall pay all related costs billed to SHMC.

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.

C. 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 except that the remaining warranty period shall be a minimum of one year following acceptance of the subject correction Work.

3.11 EVIDENCE OF PAYMENTS AND RELEASE OF LIENS

A. Submit with Final Application for Payment the following:
   2. Contractor's Affidavit of Release of Liens: AIA G706A, with
      a. Consent of Surety to Final Payment: AIA G707.
      b. Contractor's release of waiver of liens.
      c. Separate releases or waivers of liens for subcontractors, suppliers, and others with lien rights against property of Owner.

B. Duly sign and execute all submittals before delivery to SHMC.

PART 4 PAYMENT

4.01 MEASUREMENT AND PAYMENT

A. No separate measurement and/or payment will be made for any/all work and items specified or required by this Section. All requirements of this Section are considered incidental to the project and shall be fulfilled by Contractor(s) working on the project, with no additional cost to the Owner.

END OF SECTION
SECTION 26 0500  
BASIC ELECTRICAL MATERIALS & METHODS

PART 1 - GENERAL

1.01 Description

A. Furnish labor, supervision, permits, materials and equipment to complete the work required in Division 26 and by the contract documents.

B. It is the intention of this Section of the Specifications and the accompanying drawings to describe and provide for the furnishing, installing, testing and placing in satisfactory and successful operation all equipment, materials, devices and necessary appurtenances to provide a complete electrical system, together with such other miscellaneous installations and equipment hereinafter specified and/or shown on the Plans.

1.02 Contract Documents

A. The Contract Documents are complimentary, and what one affecting this Division requires shall be binding as if repeated herein.

B. Separation of this Division from other Contract Documents shall not be construed as complete segregation of the work.

C. Electrical work shall include both this Division as well as other Divisions as applicable, such as:

1. Division 27, Communications
2. Division 28, Safety & Security
3. Division 33, Utilities.

1.03 Codes


B. Code requirements shall be considered a minimum guide for the work. Where contract documents require work materials in excess of Code minimum, install work as called for in contract documents.
1.04 Permits, Licenses and Taxes

A. The Contractor shall obtain and pay for all licenses, permits and inspections required by laws, ordinances and rules governing work specified herein. The Contractor shall arrange for inspection of work by the inspectors and shall give the inspectors all necessary assistance in their work of inspection. Division 26 Contractor shall make all necessary arrangements for installation of electrical services indicated on plans.

B. Utility installation fees will be paid by the Owner.

1.05 Layout and Coordination

A. See General Conditions.

B. Before starting work, carefully examine Architectural, Civil, Landscape, Structural, Plumbing, Heating, Ventilating and Air Conditioning Drawings to become thoroughly familiar with conditions governing work on this project. Verify elevations, measurements, rough-in requirements of equipment and its installation location before proceeding with the work. Install equipment with access as required by NEC.

C. Prior Installation. Any electrical work installed prior to approval of coordination drawings shall be at the Contractor's risk. Subsequent relocations required to avoid interferences shall be made without additional expense to the Owner. In case interference develops, the Engineer will decide which work shall be relocated, regardless of which was installed first.

D. The existence of any wires, conduits, pipes, ducts or other service facilities is shown in a general way only. The Contractor is responsible for making the exact determination of the location and condition of these facilities.

E. The Drawings indicate outlet and equipment locations, directions and locations of branch circuit wiring and homeruns. Verify all locations with actual field conditions.

F. The horsepower of motors and apparatus wattages indicated on the plans and in the panel schedules are estimated requirements of equipment furnished under other Divisions of this contract and bid shall be based on these sizes. Overload elements, contactors, circuit breakers, fuses, conductors, etc., shall be furnished to suit actual equipment installed. Advise Engineer of any equipment changes affecting electrical circuits.

G. The location of utilities indicated on the plans is taken from existing public records. The Contractor must determine the exact location and elevation of public utilities. The Contractor shall ascertain whether any additional facilities other than those shown on the Drawings may be present.
H. The general directions and location of homeruns are indicated on Drawings and are to be extended to panels as though routes were completely shown. No homeruns or branch circuits are to be combined. Items which are installed other than as shown on Drawings and without receiving prior written approval will be ordered removed and installed as shown without additional cost to Owner.

I. Owner shall not be responsible for any loss of unanticipated costs that may be suffered by the successful bidder as a result of such bidder’s failure to fully inform himself in advance in regard to all conditions pertaining to the work and character of the work.

J. Coordinate work with other crafts employed on the project. Should rearrangement or relocation of equipment be necessary, provide for approval the simplest layout possible for that particular portion of the work. Under no condition are beams, girders, footing or columns to be cut for electrical items unless so shown on Plans or written approval is obtained from the Architect or Engineer.

K. Special attention shall be given for the following items and all conflicts shall be reported to the Engineer before installation for decision and correction:

1. Door swings; switches shall be located on the "strike" side of the door.

2. Location of radiators, grilles, pipes, ducts and other mechanical equipment so that all electrical outlets, lighting fixtures and other electrical outlets and equipment are clear from and in proper relation to these items.

3. Location of cabinets and counters so that electrical outlets and equipment are clear from and in proper relation to these items.

4. Within the limits indicated on the drawings, the maximum practicable space for operation, repair, removal and testing of equipment shall be provided.

5. Contractor shall coordinate with HVAC installer (if separate from the Contractor) to wire the HVAC system when the installer is ready for power.

L. Contractor shall consult the Architectural drawings for the exact height and/or location of all outlets, switches, lights, etc. specified herein or on the drawings.

M. Outlet locations shown on the drawings are approximate. Contractor shall study the building drawings in relation to spaces and equipment surrounding each outlet so that the lighting fixtures are symmetrically located according to ceiling tile and room layout. When necessary, with the Engineer's approval, outlet shall be relocated to avoid interference with structural features of the building.

N. Call to the attention of the Architect any error, conflict or discrepancy in Plans and/or Specifications. Do not proceed with any questionable items of work until clarification of same has been made.
O. Supplementary Details and Plans may be supplied as required and they will become a part of the Contract Documents. The Architect or Engineer reserves the right to make minor changes prior to installation of specific electrical systems in the location of the conduits, outlets, etc., from those shown on the plans without extra charge to the Owner.

P. Arrange work to reduce interruption of any existing service to minimum. When interruptions are unavoidable, consult Owner or Utility involved and agree in writing, with copy to the Architect, upon a mutually satisfactory time and duration.

1.06 Substitution Requests

A. Substitution of Equipment. (Prior To Bid).

1. Bids shall be based only upon the materials, construction and equipment specifically identified in the bidding documents, except as hereinafter provided.

2. If Contractors wish to use items of equipment other than those named in their base bid, Contractor shall apply in writing to the Engineer for approval of substitution at least 10 days prior to opening of bids, submitting with his request for approval complete descriptive and technical data on the items he proposes to furnish.

3. Equipment and materials proposed for substitution shall be similar in design and equal in quality and function to those specified.

4. Submittal shall be in triplicate with identification of the item to be substituted and clearly marked with all pertinent data depicting proper characteristics of proposed item.

5. Contractor's description of his proposed substitution shall specifically note all differences between the item specified and the proposed substitution.

6. If the Engineer approves any proposed substitution, such approval will be set forth in an Addendum or in writing to the person submitting equipment for approval.

7. Where a substitution alters the design or space requirements indicated, Contractor shall include all items of cost for the revised design and construction including cost of all allied trades.

8. Unless requests for changes in base bid specifications are received and approved prior to the opening of bids, as defined above, the successful Contractor will be held to furnish specified items under his base bid. After Contract is awarded, changes in specifications will be made only as defined under Substitution of Equipment. (After bid).

B. Substitution of Equipment or Materials. (After Bid).
1. After execution of the Contract, substitution of equipment or makes other than those specifically named in the Contract Documents will be approved by the Engineer for the following reasons only:

2. That the equipment proposed for substitution is equal to and/or superior to equipment named, in construction, efficiency and utility, and further that the equipment named in the specifications cannot be delivered to the job in time to complete the work in proper sequence to work of other Contractors, due to conditions beyond the control of the Contractor.

3. To receive consideration, requests for substitutions must be accompanied by documentary proof of equality or difference in price and delivery, if any, in the form of certified quotations from suppliers of both specified and proposed equipment.

4. In case of a difference in price, the Owner shall receive all benefit of the difference in cost involved in any substitution and the Contract altered by Change Order to credit Owner with any savings so obtained.

1.07 Submittals: Shop Drawings And Material Lists

A. In addition to the requirements of General Conditions of Division 01, submit manufacturers data and Shop Drawings and Material Lists as required by individual sections of Division 26 (and otherwise associated Divisions).

B. Before commencing work and within 30 days after award of contract, furnish six (6) copies of complete Shop Drawings and Material Lists to the Architect or Engineer.

C. Include only information on exact equipment installed; not complete "line" of manufacturer. Where sheets show proposed equipment as well as other equipment, identify proposed equipment with black arrow, underlining or circling. Contractor is not to use red. Diagrams for systems to be complete Drawings for specific system installed. "Typical" line diagrams not acceptable unless properly marked to indicate exact system for this project.

D. Single Submission. Data and shop drawings shall be supported and included in a single submission. Multiple submissions are not acceptable except where prior approval has been obtained from the Engineer. In such cases, a list of data to be submitted later shall be included with the first submission.

E. Shop Drawings. Shop drawings shall include complete construction details, dimensions, material descriptions, diagrams or pictures showing physical characteristics, performance and test data, description of operation, installation methods, wiring diagrams and any other data or information necessary for a complete evaluation. (Note: do not re-draw the contract drawings. The drawings to be submitted under this subsection are all the supplemental drawings and manufacturers' specification drawings which are not included in the contract drawings.) Shop drawings are in addition and supplemental to the contract drawings.
F. Identification. In addition to the requirements of Special Provisions, submittals shall be identified by the name of the system and applicable specification paragraph number.

G. Delivery Prior to Approval. No item of material or equipment shall be delivered to the site or installed, until approved. After the proposed materials have been approved, no substitution will be permitted except where approved by the Engineer.

H. Compliance. Should the Contractor fail to comply with the requirements of these provisions, the Engineer reserves the right to select any or all items of materials and systems. Selection shall be final and binding upon the Contractor. Materials so selected or approved shall be used in the work at no additional cost to the Owner.

I. Departures. If departures from the contract drawings are deemed necessary by the Contractor, details of such departures, including changes in related portions of the project and the reasons therefore, shall be submitted with the drawings. Where such departures require raceways or equipment to be supported otherwise than as shown, the details submitted shall include loadings and type and kind of frames, brackets, stanchions, or other supports necessary. Approved departures shall be made at no additional cost to the Owner.

J. Electrical Diagrams. A complete electrical connection diagram for each item of equipment furnished under Division 26, which has electrically controlled components having more than one automatic or manual control device, shall be submitted for approval. Wiring diagrams shall identify each component, and one diagram shall show all interconnected or interlocked components. It is understood that the contract electrical drawings do not have to be submitted or copied for inclusion in this submittal.

K. Contractor agrees that submittals processed by the Engineer are not change orders; that the purpose of submittals by the Contractor is to demonstrate to the Engineer that the Contractor understands the design concept, that he demonstrates his understanding by indicating which equipment and material he intends to furnish and install and by detailing the fabrication and installation methods he intends to use.

L. Late submittals will not be considered an excuse for time extension for the project.

M. Data not in conformity with these requirements will be returned for resubmittal.

N. Organization:
   1. Assemble Shop Drawings and submittal data in hard cover loose-leaf ring binder. Provide cover with permanently attached typewritten or printed
label with name of project, job number and heading reading "ELECTRICAL SUBMITTAL DATA".

2. Organize data in each set in basic categories listed in index for Division 26 (and otherwise associated Divisions). Provide submittal data with typewritten index having same sequence, numbering and wording as index for Division 26 (and otherwise associated Divisions). In addition, provide divider sheets between each section with identifying tabs having same designations as index. Organize material in each section in same order and identify with same number and wording as paragraphs of specification section.

3. Submit neat, clean copies of data, 8-1/2 inch by 11-inch size. Accordion fold required drawings to 8-1/2 inch by 11-inch size and include in submittal binder.

1.08 Electrical Equipment Operation and Maintenance Manuals

A. In addition to the requirements of the General Conditions of Division 01, submit manuals as required by individual Sections of Division 26 (and otherwise associated Divisions).

B. Provide all electrical equipment and control information. The purpose of this manual is to provide one comprehensive document that illustrates and describes all the electrical equipment and instrumentation installed in the plant.

C. For final acceptance of Division 26 work, provide to the Architect or Engineer six (6) copies of complete electrical operating and maintenance manuals for servicing of all equipment installed.

D. Information included must be exact equipment installed, not complete "line" of manufacturer. Where sheets show equipment installed as well as other equipment, identify installed equipment with black arrow, underlining or circling. Contractor is not to use red. Diagrams for each system to be complete Drawings for specific system installed. "Typical" line diagrams not acceptable unless properly marked to indicate exact system for this project.

E. Information shall include all revisions noted in shop drawings. Copies of stamped drawings are not acceptable.

F. Provide General Contractor’s name, contact person, telephone/fax numbers, include similar information for the sub-contractors.

G. Include all electrical devices provided under all Divisions. Coordinate with other Division Contractors. The Contractor shall coordinate with the Division 17 contractor and the Software Integrator to include pertinent documentation from their responsibilities in this submittal.
H. Manuals and documentation shall include calibration curves of every sensing device and a programming documentation sheet for every programmable device. The programming documentation sheet shall show the final operational value of every programmable parameter of every device. The purpose of this sheet is to provide maintenance personnel with a convenient source of information for programming the parameters of a replacement device should the old device fail.

I. Organization:

1. Assemble Shop Drawings and submittal data in hard cover loose-leaf ring binder. Contractor shall insert printed spine and cover title sheets to match font style and size of the rest of the plant O&M manual set. Coordinate with the General Contractor.

2. Organize data in each set in basic categories listed in index for Division 26. Provide submittal data with typewritten index having same sequence, numbering and wording as index for Division 26. In addition, provide divider sheets between each section with identifying tabs having same designations as index. Organize material in each section in same order and identify with same number and wording as paragraphs of specification section.

3. Submit neat, clean copies of data, 8-1/2 inch by 11-inch size. Accordion fold required drawings to 8-1/2 inch by 11-inch size and include in submittal binder.

1.09 Project Record Drawings

A. Maintain at the site one complete set of full-sized original prints for recording installed conditions (As-Builts). Keep record Drawings clean, undamaged and up to date as work progresses. Accurately indicate electrical work as actually installed with indications of all deviations, additions and omissions in red ink. Locate all buried exterior raceways or cables by actual dimensions from walls, center-lines or fixed points of reference.

B. The purpose of these Record drawings is to provide the Engineer with an easy to read, complete record of the installation so that at the end of the project the Engineer can revise the original contract drawings to represent the actual installation. Color-coded and highlighted notes shall be used if these would make the Record Drawings easier to read.

C. At the completion of the work, Contractor shall furnish the Engineer this original set of marked-up drawings. Final payment to the Contractor will not be authorized until these drawings have been submitted to and accepted by the Engineer.

1.10 Certificates

A. For final acceptance of Division 26 work (and that of otherwise associated Divisions), provide certificate of approval from the applicable regulatory and permit-
ting agencies certifying that the electrical work has been inspected and that the work conforms with the minimum requirements of the State Electrical Codes.

1.11 Warranty

A. See Division 01.

PART 2 - PRODUCTS

2.01 Materials

A. Unless otherwise specified, all material to be new of recent manufacture, carrying full factory warranty, UL approved or approved by local inspection authority.

B. All like materials shall be by the same manufacturer throughout the project.

C. All material shall be new and bear manufacturer’s name, model number, electrical characteristics and other identification and shall be the standard product of manufacturer regularly engaged in production of similar material.

D. Access Panels:

1. Provide access panels of adequate size for equipment requiring service and installed above plaster or gypsum board ceilings, behind walls or in furring.

2. Furnish complete with correct frame for type of building construction involved. Size, number and location of access panels is not necessarily shown on Drawings.

3. Use no panel smaller than 12 inches by 12 inches for simple manual access, nor smaller than 16 inches by 20 inches where personal must pass through.

4. Access panels shall maintain ceiling fire rating.

5. Acceptable Manufacturers: Milcor A, K, L, or M panels or equivalent Bilco or Potter - Roemer as required by construction.

PART 3 - EXECUTION

3.01 Excavation/Trenching

A. Provide trenching, backfilling, compaction, repaving or other site restoration as required by the work done in this Division.

B. Determine location of all existing underground gas, water, sewer, telephone and electric lines. Locate accurately on ground surface and for depth of same before excavation. Uncover by hand digging. Contractor shall be responsible for any
damage or interruptions to these utilities, caused by himself, and other costs incurred by these interruptions.

C. Do not undermine footings or bearing walls.

D. Use power-digging equipment only in direction away from existing facilities.

E. Exercise standard safety precautions in excavation near power cables by using insulated handles, rubber gloves and footwear, etc.

F. Do not place backfill until installation to be covered has been tested, inspected and approved.

G. Minimum conduit burial depth shall be 24 inches, unless otherwise noted.

H. Install a detectable six inch wide yellow vinyl tape with letter “Caution: Buried Electrical Line Below” 18 inches above all buried services conduit and wire not under structures.

I. Backfill:
   1. Backfill material for all trenches under paved areas shall be coarse sand or crushed rock, installed in layers not to exceed six inches and compacted to 95% of maximum density at optimum moisture content to preclude subsequent settlement.
   2. The top 18 inches of trenches in landscaped or grassed areas shall be backfilled with native soil and tamped.

J. Conduits piercing a building waterproof membrane shall be provided with flanges, using two neoprene washers, one washer on each side of membrane, between each flange and membrane.

K. All underground conduits which enter the building penetrating poured-in-place slabs:
   1. Shall be sloped to drain away from the building and shall be water sealed to prevent moisture from passing through the conduit into the building. All joints to be threaded and taped or glued to prevent entry of water into the conduits.
   2. Shall be poured-in-place, or provide with watertight conduit sleeves and rubber seals, Link-seal system by Thunderline Corporation or equivalent.
   3. Shall be rigid galvanized steel a minimum of 12-inches under the slab and 6-inches above the slab.

3.02 Cutting

A. Perform or arrange and pay for required cutting of concrete, masonry, wood, structural framing, etc.
B. Cutting or channeling of underpinning or structural members is not permitted without prior permission of the Engineer.

C. No weakening of structural parts is permitted and the Contractor will correct any work impaired.

3.03 Patching

A. Where trenching is done through existing paving, walks, curbs, etc., the Contractor is responsible to patch and repair these structures to original condition.

B. Patch all openings in and through concrete and masonry with dry pack.

C. In new work, patch and refinish all finished surfaces damaged by this contractor to match adjacent surface.

D. Where new electrical work is installed in the existing building, patch and refinish surfaces damaged to match existing. Refinishing to be as directed by the Architect or Engineer.

3.04 Framing And Blocking

A. Structural framing will be done by the Contractor.

B. Blocking required for sole use of electrical work such as fastening and support of outlet boxes, fixtures, panels, conduit, etc., will be by the Electrical Contractor.

3.05 Housekeeping Pads

A. Provide concrete housekeeping pad under Motor Control Centers, transformers, pumps, or any floor mounted switchboard.

3.06 Protection

A. Cap or plug all raceway openings during construction.

B. Protect all completed work against dirt, water or chemical damage, mechanical accident or injury.

C. Equipment found damaged or in other than new condition will be rejected as defective.

3.07 Sleeves

A. Where conduit passes through masonry or concrete, install sleeves during construction of same.

B. Where conduit must by necessity pass through beams or columns, install sleeves located as directed by Engineer.
3.08 Identification

A. Label complete electrical system to indicated use of each item of equipment or load served.

B. Identification of Disconnecting Means: Provide identification of disconnects in accordance with Section 110-22 and Section 240-83 of the National Electrical Code.

C. Identification of Conductors and Components for Distribution Systems Operating at Two or More Different Voltages: Identify components in accordance with Section 210-4(d) of the National Electrical Code. Required labeling shall be by Micarta plate.

D. Provide black laminated white core engraved nameplates with lettering not less than 3/16 inch high attached to the outside of junction boxes larger than 4-11/16 inch; surface mounted cabinets, panelboards, time switches; disconnect switches, starters, contactor, relays; subdistribution and branch circuit panelboards, dry transformers and other items indicating equipment or load served. At flush mounted cabinets, panelboards, time switches and similar items mount nameplate on inside of door at finished areas and on outside of door at mechanical, storage rooms and other non-public spaces. Attach nameplates with epoxy glue.

E. Flush mounted devices with stainless steel or plastic finish plates requiring identification to be engraved with lettering not less than 1/8 inch high with black color filling.

F. Provide typewritten circuit schedules for panelboards, cross-connect panels and terminal cabinets. Schedules shall be covered with minimum of 0.018 inch thick clear rigid plastic installed in permanently attached metal frame holder located on inside face of door. Schedules to use final assigned room names/numbers, loads not plan designations.

G. When making modifications to existing equipment or panelboards, provide labels as indicated in this section. Provide new typewritten circuit schedules for all modified panelboards.

H. At Main Distribution Panels provide black laminated white core engrave nameplates attached to panel exterior with epoxy glue. Size of nameplate and lettering as directed. Label distribution breakers, main breakers, sub-breakers and panel sections to identify all components and voltage and phase of system. In addition, provide master nameplate indicating project name, date, Architect (when applicable), Electrical Engineer, and Electrical Contractor. Lettering minimum of 1/4 inch high. Provide half-sized electrical one-line diagram(s) framed and mounted on wall near main distribution panel(s).

3.09 Installation
A. Wiring Requirements: Install wiring complete to every outlet with all devices shown and/or required. All wiring to be in raceways and concealed throughout finished areas unless specifically noted otherwise. For the purpose of electrical specifications, all areas, with the exception of boiler rooms, mechanical rooms and mechanical spaces, are to be considered as finished areas.

B. Provide raceway connections between outlets, outlets and panels and equipment and panels as shown on Drawings. Size raceways according to governing codes unless otherwise noted.

C. Locations:
   1. Verify all locations with actual field conditions, and plans to avert possible installation conflicts.
   2. Coordinate work with that of other trades to assure symmetrical placing of fixtures in respect to ceiling tile, grilles, etc.
   3. Cabinets: Where electrical outlets occur in face, decks or base of cabinets or in walls above counters, carefully coordinate with details and arrangements of same.
   4. Any work, which is incorrectly installed without prior verification with General Contractor, Architect, Engineer and Drawings, will be ordered removed and relocated and any damage to other work shall be repaired at no cost to the Owner.
   5. In general, locate outlets as indicated in symbol schedule on Drawings.

D. All mounting heights shown on drawings are from finish floor to centerline unless otherwise shown. Mounting heights at non-typical locations shown with (+) sign and height required noted adjacent to outlet. Outlets located in concrete block, brick or tile walls are to be adjusted in height to coordinate with modular joints of the materials.

3.10 Painting

A. Painting in general will be covered under another Division of this specification, except items furnished under this Division that are scratched or marred in shipment or installation and/or require custom painting.

B. Install equipment with manufacturer's standard finish and color unless otherwise specified. Refinish any marred or oxidized items restored to manufacturer's factory finish.

C. Required surfaces or equipment with no standard finish; clean off grease and scale. Restore to smooth finish. Give one coat of primer, two coats finish.

D. Paint and color as selected by Architect or Engineer.
E. All exposed conduits on painted walls shall be painted to match wall and trim colors. Conduit labels shall be neatly affixed and shall not be painted over.

F. All electrical equipment and conduit exposed in finished areas and on exterior walls shall be painted to match surrounding surfaces.

G. Contractor shall coordinate the timing of painting requirements.

H. Refer to architectural specifications for methods and materials.

3.11 Future Provisions

A. Provide pull line in each empty conduit provided for future installation of wiring.

B. In general, all wiring installed so it will not be necessary to remove existing conductors and repull additional wiring to install additional units. All spare conductors properly labeled and terminated in outlet boxes or at terminals in terminal cabinets.

3.12 Fire-Stopping

A. Where raceways penetrate floors, ceilings, ducts, chases and fire walls, provide fire stopping to maintain integrity of the fire assembly. The code authority having jurisdiction shall approve fire-stopping method.

B. Where electrical boxes exceeding 16 square inches are located in fire resistive walls, fire stopping shall be provided to maintain integrity of the fire assembly.

3.13 Continuity Of Service

A. Keep outages to occupied areas to a minimum and prearrange all outages with Owner, Engineer and utilities involved. Requests for outages shall state the specific dates and hours and the maximum durations, with the outages kept to these specified times. When power interruptions will last longer than 5 minutes and cover more than 10% of the building, or affect public areas, they shall be performed on the weekend between 1 and 5 AM.

B. Contractor shall coordinate with Owner or Engineer so that work can be scheduled not to interrupt operations, normal activities, building access, etc. Coordinate work with other crafts for proper scheduling.

C. No circuits shall be turned off without prior approval from Owner or Engineer. Coordinate with the operations, normal activities, building access, etc. Coordinate work with other crafts for proper scheduling.

D. This contractor shall be liable for any damages resulting from unscheduled outages or for those not confined to the preapproved times. Include all costs for overtime labor as necessary to maintain electrical services in the initial bid proposal.
Temporary wiring and facilities, if used, shall be removed and the site left clean before final acceptance. Requests for outages must be submitted at least (5) days prior to intended shutdown time.

E. When applicable, include in bid cost of minimum temporary power to Fire Alarm System, Security, Telephone/Data equipment and any other equipment designated by Owner, during time when primary building power has been interrupted.

3.14 Safety

A. The Drawings and the specifications do not include design or construction details or instructions relating to the Contractor's safety precautions or to means, methods, techniques, sequences or procedures required for the Contractor to perform his work.

B. The Contractor shall provide necessary shoring, railing, barricades, protective devices, safety instructions and procedures to perform the work safely and to comply with State Safety Requirements and OSHA requirements.

3.15 Cleanup

A. Contractor shall continually remove debris, cuttings, crates, cartons, etc., created by his work. Such clean up shall be done at sufficient frequency to eliminate hazard to the public, other workmen, the building or the Owner's employees. Before acceptance of the installation, Contractor shall carefully clean cabinets, panels, wiring devices, cover plates, light fixtures, etc., to remove dirt, cuttings, paint, plaster, mortar, concrete, etc. Blemishes to finished surfaces of apparatus shall be removed and new finish equal to the original applied.

3.16 Testing.

A. Test the entire electrical installation to assure compliance with code and proper system operation.

1. Circuit Tests. The Contractor shall test all wiring and connections for continuity and ground before any fixtures or other loads are connected. Tests shall be made with a 500 volt DC "Megger" type tester. If tests indicate faulty insulation (less than 2 megohms) such defects shall be corrected and tested again. Contractor shall provide all apparatus and material required to make tests and shall bear all expense of required testing.

2. Load Balancing. Checks shall be made for proper load balance between phase conductors and make adjustments as necessary to bring unbalanced phases to within 15% of average load.

3. Ground Testing. Measure the OHMIC value of the Electric Service Entrance metallic "System Ground" with references to "Earth Ground" using the "Multiple Ground Rod" method and suitable instruments. Maximum resistance to ground shall be less than 10 ohms. If this resistance cannot
be obtained with the ground system shown, notify the Engineer immediately for further instruction. Certify in writing to the Engineer that the grounding test has been made and that the requirements of this portion have been met for the "System Ground".


B. Materials and instrumentation shall be provided by the Contractor.

C. The Contractor shall notify the Engineer ten (10) working days prior to performance of any test.

D. The Contractor shall certify in writing that the above tests have been completed and shall provide documentation of test data.

3.17 Instruction Of Owner Employees

A. Instruct operation and maintenance personnel selected by Owner's representative at a single designated time in operation and maintenance of the entire electrical system and its components.

B. Electrical Contractor shall provide one 8-hour working day of instruction to Owner designated personnel. Software Integrator shall provide one 8-hour working day of instruction to Owner designated personnel after all equipment is fully operational and functional. The time for this instruction shall be scheduled shortly after start-up and at mutually agreed times. Contact Engineer for coordination.

C. Specific sections elsewhere in this Division may require additional training.

D. On completion of instructions, obtain from Owner certification in writing that demonstration had been given and instructions had been understood.

3.18 Demonstration Of Completed Electrical System And Controls

A. At the point of substantial completion of the project, the Electrical Contractor shall provide necessary personnel to demonstrate the essential features of the following electrical systems:

1. Service entrance equipment.
2. Lighting system.
3. Heating system.
4. Ventilation.

B. Demonstrate each system once after all malfunctions have been corrected.
C. Time. Demonstration shall be held upon completion of all systems at a date agreed upon in writing by the Owner or his representative. This time shall be in addition to the instruction allowances provided.

D. Attending Parties. The demonstration shall be held by the Contractor and Electrical Subcontractor in the presence of the Owner or his designated representative, Electrical Engineer, Project Engineer, and the Equipment Manufacturer's representative.

E. Demonstration.

1. Demonstrate the functions and locations of each system, and indicate its relationship to the Riser Diagram in the Drawings.

2. Demonstrate by "start-stop operation" and "automatic operation", how to work the controls, how to reset protective devices or replace fuses, and what to do in case of emergency.

3. All systems shall be exercised through operational tests in order to demonstrate achievement of the specified performance. Operational tests depend upon completion of work specified elsewhere in these Contract Documents. The scheduling of tests shall be coordinated by the Contractor among all parties involved so that the tests may proceed without delays or disruption by uncompleted work.

F. Certificate of Complete Demonstration. Submit a Job Completion Form found at the end of this Section. Provide documentation of all test data.

PART 4 - PAYMENT

4.01 Payment for Work.

A. Payment for work under this Division shall be Lump Sum.

END OF SECTION
PART 1 - GENERAL

1.01 Description
   A. Provide conductors, cables, connectors, lugs, cable ties and terminations for all systems.
   B. Related work in other sections includes:
      1. Providing raceways and boxes, Section 26 0533, Raceways and Boxes.

1.02 Quality Assurance
   A. UL listed.

1.03 Submittals
   A. Submit product data sheets for primary service conductors, terminators and load break elbows per Section 26 0500.

1.04 Product Delivery, Storage And Handling
   A. Deliver conductors and cables in complete coils with UL label and bearing manufacturer's name, wire size and type of insulation.
   B. Store and handle material so as not to subject them to corrosion or mechanical damage and in a manner to prevent damage from environment and construction operation.
   C. Deliver conductors No. 10 and smaller in manufacturer's original unopened and undamaged cartons with labels legible and intact.

PART 2 - PRODUCTS

2.01 Secondary service entrance conductors: Copper 600 volt type "THW", "THHN", or "XHHN" stranded, unless otherwise noted. Sizes as shown on Drawings.

2.02 Feeder conductors:
   A. Copper, 600 volt, type “THW”, “THHN” or “XHHW” unless otherwise noted, sizes as shown on drawings.
   B. Aluminum conductors are acceptable as panelboard feeders as shown on drawings for copper sizes #2/0 AWG and above only.
C. Drawings are based on copper conductors, contractor to provide a list of conductor and conduit sizes to the Engineer for review for all aluminum conductors to be used. List to be provided prior to ordering material.

2.03 Branch circuit conductors:

A. Copper, minimum size No. 12 AWG. Conductors No. 12 and No. 10 AWG shall be soft drawn, solid copper. Conductors larger than No. 10 AWG to be stranded, soft-drawn copper. Use type "THW", "THWN", or "THHN". Special conductor types where noted or required by code.

2.04 Splices, connections, terminations and cable ties:

A. Conductors No. 6 or larger, spliced, taped or terminated with solderless hydraulically applied crimp type connectors unless otherwise noted. T&B, Burndy or approved. Splices to be covered with heat shrink tubing of insulation value equal to wire insulation and wrapped with Scotch No. 33 electrical tape, half lapped.

B. Connectors: Conductors smaller than No. 6 made with 3M Company Hyflex No. 212 and No. 310, Ideal Wing-Nut, "T&B" Piggys, or approved spring connectors.

C. Lugs: Conductors No. 6 and larger, except on molded case circuit breakers, two hole, long barrel pressure tool set Thomas & Betts No. 54,000 series, Burndy "Hydent", Anderson Electric VCEL, or approved.

D. Terminal Strips:
   2. All Other Systems: Molded base screw terminals "Buchanan" medium Duty Cat. 525 with tubular clamp flat base for direct mounting with center designation strip and W.H. Brady wire markers.

E. Cable ties: Thomas & Betts "Ty-Raps" of size and length required.

F. Color identification for feeder conductors: Brady B-500, vinyl cloth pipe banding tapes, Scotch Vinyl Plastic Electrical Tape No. 35, or approved.

G. Fluorescent lighting fixture ballast channel tap connectors: Electro-Products Division 3M Company "Scotchlock 567".

H. Cable and conductor identification: W.H. Brady wire markers.

PART 3 - EXECUTION

3.01 Inspection
A. Determine raceways are complete and clean of all foreign matter before installing conductors.

3.02 Delivery, Storage and Handling.

A. Deliver to site in new standard coils or reels with approved tag denoting length, wire size, insulation type and manufacturer's name.

B. Suitably protect from dirt, weather, and damage during storage and handling.

3.03 Wire Pulling.

A. Do not pull wire until all work of any nature is completed which might damage insulation or fill conduit with foreign material. Conduits shall be clean and dry before pulling wire.

B. Do not use mechanical means to pull #8 or smaller wires.

C. Exercise care in avoiding injury to wire or insulation during pulling.

D. Identify wires or circuits with wire markers after pulling. For all control wiring and telemetering systems, wire markers in junction boxes and at solenoids shall bear same numbers as terminal blocks. Keep accurate up-to-date as-built records.

3.04 General Installation

A. Circuiting. Install branch circuiting exactly as shown. Conduit may be routed at Contractor's best judgment unless directed otherwise. Home runs are diagrammatic for clarity, and may be grouped as desired. Size conduits accordingly with capacity for 25% future fill.

B. Feeder conductors: Wires shall be factory color-coded by integral pigmentation. Colored plastic tape permitted on No. 6 and larger where integral pigmentation impractical. Apply tape in spiral half-lap over exposed portions in manholes, boxes, panels, switchboards and other enclosures.

C. Branch circuit conductors: Identify with factory color conductors with separate color for each phase and gray or white for neutral.

D. All circuit conductors shall be identified with circuit number at all terminals, intermediate outlets, disconnect switches, circuit breakers, motor control centers, etc. Both ends of a given conductor shall be identified alike.

E. Install wire in conduit runs after concrete and masonry work is complete and after moisture is swabbed from conduits.

F. Apply pressure tool set lugs with tool specifically designed for application of lugs by lug manufacturer.
G. Leave six-inch single wire pigtails for connection of fixture leads and devices to branch circuits.

H. Make splices and taps only where specifically shown or approved in approved junction or splice boxes.

I. Neatly bundle and tie with cable ties conductors in panel gutters, wire gutters, motor control centers, dimmers, etc. where multiple conductors run in accessible wireways. Spacing as required to neatly group and support conductors.

J. Cable feeder and service conductors at switchboards and panel gutters. Feeder conductors cabled together as a group for one feeder and not combined in same cabling with other feeders. Cabled conductors supported from devices built into switchgear and not supported from terminals or lugs.

K. Install conductors carrying different voltages in separate raceways unless noted otherwise. Where installed in common wireways or gutters, identify neutral per NEC Article 200.

L. Quantity of conductors shown in any one raceway is not to be increased without specific permission of Engineer.

PART 4 - PAYMENT

4.01 Payment for Work.

A. Payment for work under this Division shall be Lump Sum.

END OF SECTION
SECTION 26 0526
GROUNDING AND BONDING

PART 1 - GENERAL

1.01 Summary

A. Provide a complete grounding system for all electrical equipment in accordance with NEC Article 250 and established safety practices.

B. Provide grounding grid at pad-mounted transformers.

C. Provide a main grounding electrode consisting of a bare No. 4 copper grounding electrode conductor connected to a concrete-encased electrode. Concrete-encased electrode provided by others. See detail on Architectural Drawings.

D. Provide a complete grounding electrode system. All building electrodes must be tied into this system per 250.50 of the NEC. These building electrodes are: the main concrete-encased electrode, any metal underground water pipe that is in direct earth contact for at least ten feet, and the metal frame of the building where effectively grounded.

E. The grounding electrode system is to include, but is not limited to: grounding conductors, fitting connectors and all other devices and material as required rendering the system complete.

1.02 Related Work In Other Sections

A. Providing conductors, Section 26 0523, Conductors and Cables.

B. Providing raceways, Section 26 0533, Raceways and Boxes.

1.03 Quality Assurance

A. UL listed.

PART 2 - PRODUCTS

2.01 Materials

A. Ground connectors: Bronze clamp type. All clamp accessories such as bolts, nuts and washers shall also be bronze to assure a permanent corrosion resistant assembly. Bolts used to fasten lugs to enclosures must be case hardened and sized for lug hole and hole drilled into enclosure. O-Z Gedney, Burndy, Ilsco or approved.

B. Ground rod clamps: Exothermic welding type or one piece cast bronze with safety set screw. Cadweld "G" series, Copperweld 6500 series, or approved.
C. Ground rods: Copper or steel core copper covered, minimum 5/8 inch by 10'-0'. Copperweld 9400 series, or approved.

D. All ground cable splices and joints to be made with an exothermic welding process that shall provide a weld with current-carrying capacity not less than that of the conductors welded. Soldered connections not to be used.

PART 3 - EXECUTION

3.01 Installation

A. Install in accordance with NEC Article 250.

B. Except where specifically indicated otherwise, all exposed non-current carrying metallic parts of electrical equipment to be bonded together to limit any difference of potential voltage. Metallic raceway systems may be considered the equipment grounding system where specifically noted or where approved in the NEC. Equipment grounding conductors must be installed in all non-metallic conduit systems. All load side equipment to have the neutral system isolated from the equipment grounding system. The equipment grounding system must provide a low impedance path from the equipment back to the source equipment-grounding bar. This equipment-grounding bar to be connected to the system neutral at the source by a main bonding jumper sized per NEC 250.28. 250.102, and 250.168. The equipment grounding conductors to be sized at least as large as required by NEC 250.122.

C. The grounding electrode system to connect to the service neutral, if required, or to the system grounded conductor if a neutral is not required. The electrode system may terminate on the equipment-grounding bar at the main service where a properly sized main bonding jumper has been installed. Water system bonding must utilize the proper size water pipe bond clamp to match the size of the water pipe.

D. Electrical Equipment Grounding (Safety Ground):

1. Ground non-current carrying metal parts of electrical equipment enclosures, frames, man-holes, conductor raceways or cable trays to provide a low impedance path for line-to ground fault current and to bond all non-current carrying metal parts together.

2. Equipment grounding conductor to be electrically and mechanically continuous from the electrical circuit source to the equipment to be grounded. Size ground conductors per NEC 250.122 unless larger conductors are shown on drawings.

3. Grounding conductors to be identified with green insulation. Where green insulation is not available, on larger sizes, black insulation to be used and suitably identified with green tape at each junction box or device.
4. Install metal raceway couplings, fittings and terminations secure and tight to ensure good ground continuity. Provide grounding bushing and bonding jumper where metal raceway is not directly attached to equipment metal enclosure, at concentric knock-outs, or at concentric or eccentric knockouts for circuits of over 250v to ground.

5. Lighting fixtures to be securely connected to equipment grounding conductors. Outdoor lighting standards to have a factory installed ground lug for terminating the ground wire.

6. Bonding to be provided to assure electrical continuity and the capacity to conduct safely any fault current likely to be imposed.

7. All plug-in receptacles to be bonded to the boxes, raceways and grounding conductor.

8. Equipment grounding conductors to be provided for all lengths of flexible metallic conduit. All equipment provided with two conductor cords to be rewired to provide a three-conductor type "S" cord and grounding attachment plug caps.

E. Neutrals throughout the system to be solidly grounded to one point at the system source.

F. Lighting and power panelboard to be grounded by connecting a conductor to the grounding stud and to the incoming and outgoing feeder conduits grounding bushings. Each grounding-type bushing to have the maximum ground wire accommodation available in standard manufacturer for the particular conduit size. Connection to the bushing to be with wire of this maximum size.

G. The grounding stud of each secondary voltage dry type, three phase transformer to be connected separately to the grounding lug on the panelboard serving the transformer. Connection to be by means of an insulated conductor run in conduit, sized as shown on the drawings.

H. Provide a No. 6 green coded insulated conductor from each telephone terminal board to the closest effectively grounded water pipe or structural steel.

I. When included as part of the project, the central equipment for the fire detection and alarm system is to have its grounding terminal connected to the ground lug on the panelboard serving the system by means of a No. 6 green coded insulated conductor, run in 3/4 inch metal conduit, utilizing a ground clamp.

3.02 Testing

A. Grounding Electrode Conductor (GEC):

1. Measure resistance between service equipment ground bus and each grounding electrode, using a Megger and a single length of additional
wire, if necessary. Measure resistance between both ends of the additional wire used. Isolate and correct any poor connections as indicated.

B. System Ground Continuity:

1. At panels and selected outlets, measure the ground loop resistance between the neutral conductor and raceway using a megger or equivalent. Or, at selected outlets, measure the ground loop impedance using a ground loop impedance tester.

2. Ground loop impedance shall not exceed a value in ohms that is the voltage to ground divided by five (5) times the rated current.

3. Isolate and correct the cause of the poor connection. If the source of the high reading cannot be practically corrected, pull a separate ground conductor into the raceway and re-test.

4. Report findings to Engineer.

PART 4 - PAYMENT

4.01 Payment for Work.

A. Payment for work under this Division shall be Lump Sum.
SECTION 26 0533
RACEWAYS AND BOXES

PART 1 - GENERAL

1.01 Description

A. Provide all raceways, fittings, outlet boxes, junction boxes, pull boxes and special boxes required for complete project. Install all systems in raceways unless specifically noted otherwise.

B. Not all conduits are shown. Where not specifically indicated, Contractor shall be responsible for sizing conduit per applicable codes for number of conductors.

C. Related work in other sections includes.
   1. Providing conductors, Section 26 0519, Conductors and Cables.
   2. Providing boxes, Section 26 2726, Wiring Devices and Floor Boxes.
   3. Providing supporting devices, Section 26 0529, Hangers and Supports.

D. RV Utility Pedestals - see Drawings for Specifications.

1.02 Quality Assurance

A. UL listed.

1.03 Product Delivery, Storage And Handling

A. Deliver raceways with UL label and bearing manufacturer's name on each length.

B. Store and handle raceways and boxes so as not to subject them to corrosion or mechanical damage and in a manner to prevent damage from environment and construction operation.

C. Cap raceway ends until used.

D. Deliver fittings in manufacturer's original unopened and undamaged packages with labels legible and intact.

PART 2 - PRODUCTS

2.01 Rigid galvanized steel and IMC conduit:

A. Rigid galvanized conduit: Rigid steel zinc coated, manufactured in accordance with UL-6, ANSI, and Federal Specifications WW-C-540 standards.

B. Intermediate Metal Conduit (IMC): Zinc coated galvanized steel to comply with UL-1242, Type J and ANSI Standards.

C. Application:
1. Employed for runs embedded in concrete, concrete block, underground, wet or damp locations, where subject to mechanical injury, and where exposed within eight feet of floor.

2. Make threads watertight with bituminous sealer (solvent type cut back) before assembly where installed underground, in moist locations or where exposed to weather.

D. Fittings: Threaded iron or steel only, Thomas & Betts or O-Z/Gedney in sizes up to 1-1/2 inch plastic insulating type O-Z/Gedney type "A", or "T&B" 220 Series; sizes above 1-1/2 inch insulated metallic bussings O-Z/Gedney type "B" and "T&B" 1220 Series.

2.02 Rigid Stainless Steel conduit: Solid stainless steel.

A. Application: Required in most outdoor marine or corrosive environments or as specified.

B. Fittings: Threaded stainless steel. Erickson couplings, watertight split couplings (OZ or equivalent) permitted so long as all components are of the same stainless steel alloy and are waterproof.

2.03 Electrical metallic tubing (EMT): Steel zinc coated, to comply with ULI-797 and ANSI Standards.

A. Application:
   1. Dry locations only. May be used in framed construction, furred ceilings and above suspended ceilings.
   2. May be exposed in unfinished areas where not subject to damage.

B. Fittings: Connectors and couplings to be case steel. Preinsulated connectors and couplings up to one (1) inch trade size may be compression, indenter or setscrew type. Fittings above one (1) inch trade size shall be compression type. All connectors shall have insulated throats. Thomas & Betts, Steel City or approved.

2.04 Liquidtight flexible metal conduit: Zinc steel core with smooth gray abrasion resistant, liquidtight, polyvinyl chloride cover (with integral ground wire wound in steel core), to comply with UL 360 and ANSI Standards. Anaconda Sealtite type U.A. Electro Flex L4, Alflex Ultratite UL or EF or approved.

A. Application: For connection to equipment. Minimum size 3/4-inch for motor connections. Use 3/8-inch only for fixture and control wiring. Provide sufficient length of flexible conduit to avoid transmission of vibration.

B. Fittings: “Thomas & Betts” Supertite or approved.
2.05 Flexible metal conduit, to comply with UL360, ANSI Standards, and Federal Specification WW-6-566.

A. Application:
   1. Permitted only in dry locations where flexibility is required in length not over 18 inches.
   2. Minimum size required 1/2 inch, unless noted otherwise.
   3. Where flexibility is not required, flexible metal conduit is not to be used without written permission of the Architect or Engineer.

B. Fittings: Screw-in-type factory preinsulated "Thomas & Betts".

2.06 Non-metallic conduit: Polyvinyl chloride schedule 40 heavy wall UL listed for underground and exposed applications in accordance with National Electrical Code to comply with NEMA TC2. Carlon Electrical Products, PWC or approved.

A. Application:
   1. Permitted for runs embedded in concrete or underground in wet or damp locations.
   2. All conduit offsets and bends made with factory fittings.
   3. All 90 degree ells and conduit entrances into buildings to be with rigid galvanized conduit.
   4. PVC conduit installed under roadways or areas subject to heavy traffic shall be provided with a minimum of 36" cover.
   5. Galvanized rigid elbows shall be used for angles larger than 30 degrees where the conduit size is greater than one inch.
   6. Provide a ground wire sized per code in all PVC conduits. Conductor quantities indicated in conduits do not include ground wires unless otherwise noted.

2.07 Seals and Fittings:

A. Conduit plugs: Ideal "Conduloc" sizes 1/2 inch through one inch and T&B, Push Penny Plugs Series 1470 for 1-1/4 inch and larger, or approved for sealing conduits during construction. Steel City PL-200 series screwdriver slot threaded meter plugs or Killark Cat. No. CUP-O through CUP-9 for permanent plugs.

B. Floor and wall entrance fittings: O-Z/Gedney Electrical Mfg. Co. Type "FSK" entrance seal.

C. Expansion fittings: O-Z/Gedney Electrical Mfg. Co. Type ‘E’ expansion coupling with bonding jumper for up to four inch of movement.

D. Conduit seals: Vertical or horizontal type Crouse Hinds type "EYS" or approved.
E. Lead Roof Flashing Assembly: Open top caulk, six inch diameter skirt, Stoneman Engineering & Manufacturing Company No. S1000-4 for 1/2 inch diameter through eight inch diameter. Caulking compound G.E. Silicon Construction Seal- ant SCS-1200 or Dow Corning 781. Refer to Architectural.

F. Wall and floor fire and smoke barriers: Concrete floor type O-Z/Gedney Gedney Co. "Fire Seals" or approved. UL labeled fire barrier material installed in accordance with manufacturer's recommendations. 3M Branch Fire Barrier System; Chase Technology Corp. No. CTC PR-855; Fire Stopping Products SpecSeal, Putty, Sealant, Collars, and Mortar; or approved.

2.08 Pull lines: Polyline as manufactured by "Greenlee" or approved.

2.09 Underground Marking Tape:

A. Power: 6” wide, yellow, low density polyethylene, 4-mil thickness. Imprinted with “CAUTION – STOP DIGGING – BURIED ELECTRIC LINE BELOW” and current date. Somerset “Protect-A-Line” or approved.

B. Telephone/Data: Similar to Power tape except green.

2.10 Boxes

A. Pullboxes

1. Pullboxes: Galvanized steel (indoors) or cast metal (exterior or damp locations) construction, conforming to National Electrical Code, with screw-on cover.

2. Flush Mounted Pullboxes: Provide overlapping covers with flush-head retaining screws, finished in light grey enamel.

3. Box volumes shall meet NEC for size and number of entering conduits.

B. Weatherproof Outlet Boxes:

1. Provide corrosion-resistant cast metal weatherproof outlet wiring boxes, of the type, shape and size, including depth of box, with threaded conduit ends, cast metal face plate with spring-hinged waterproof cap suitably configured for each application, including face plate gasket and corrosion proof fasteners.

2. Weatherproof boxes to be constructed to have smooth sides, gray finish.

3. Boxes used in contact with soil shall be cast iron alloy with gasketed screw cover and watertight hubs.

4. Weatherproof Plates: Cast metal, gasketed, for switches and receptacles provide spring-loaded doors.

C. Weatherproof Junction and Pullboxes:
1. Provide galvanized sheet steel junction and pullboxes, with screw-on covers; of the type, shape and size, to suit each respective location and installation; with welded seams and equipped with stainless steel nuts, bolts, screws and washers.

D. Knockout Closures: Provide three (3) piece punched-steel knockout closures.

PART 3 - EXECUTION

3.01 Installation

A. General Installation:

1. In general, install raceways concealed in construction except where shown otherwise on the Drawings or unless specifically approved by Architect or Engineer.

2. Unless otherwise noted, size raceways in accordance with Table in Appendix C of NEC for type "THW" conductors regardless of type of conductor specified.

3. Two or more conduits using the same routing: Mount on channel support system. Unistrut or approved.

4. Provide pull line and cap off watertight each empty conduit provided for future installation of wiring.

5. Conduit stubbed from a concrete slab or wall to serve an outlet under a table or to supply a machine shall have a rigid conduit coupling flush with the surface of the slab. Provide plug where conduit is to be used in future.

6. Allow minimum of 6 inches clearance at flues, steam pipes, and heat sources. Do not run conduits beneath boilers or heating units.

7. Dissimilar Metals: Avoid contact with pipe runs of other systems.

B. Lengths and Bends:

1. Maximum number of bends in any run shall be the equivalent of three (3) 90 degree bends (270 degrees total). Maximum length of any run shall be 100 feet, except as allowed in underground installations.

2. Junction and pull boxes shall be provided to maintain these limits. Do not locate pull boxes or junction boxes in finished areas unless specifically shown or special permission is obtained from Architect or Engineer.

C. Exposed raceways:

1. In finished areas run parallel with or at right angles to building structural lines and closely follow surfaces wired over. Conduits offset at panels, outlets, junction boxes, etc. Conduit 1-1/2 inch and larger suspended at locations as directed by Architect or Engineer.
2. In accessible void and furred spaces, conduit may be run in a direct line between outlets with long sweep bends and offsets closely following surfaces wired over. Suspend conduit 1-1/4 inch and larger to be run to allow maximum access to space and located as directed by Architect or Engineer.

3. For exposed runs, attach surface mounted conduit with clamps. Where conduit runs along the inside of exterior walls, mount to channel-type strut at required spacing.

D. Concealed raceways:

1. At inaccessible areas, raceways may be run in a direct line with long sweep bends and offsets. In cavity walls, run conduit in hollow spaces and do not chase interior or exterior masonry.

2. At accessible areas above lift-out or accessible ceiling areas, run conduit on top or bottom of lower cords or trusses or on underside of roof. Vertical extensions for wiring to ceiling outlets and fixtures kept to minimum length.

E. Underground raceways:

1. Use galvanized rigid steel or Schedule 40 PVC with galvanized rigid steel elbows and risers.

2. Maximum length of any run shall be 300 feet, less 50 feet for each equivalent 90-degree bend.

3. Install underground marking tape buried 6-8 inches below grade, directly above conduit.

4. Run in a direct line with long sweep bends.

5. Raceways inside of building run below slab in gravel fill.

   a. Rigid Galvanized: Minimum 24-inches below finish grade, unless noted otherwise.
   b. PVC: Where installed under roadways or areas subject to heavy traffic provide a minimum of 36-inches of cover. All other locations, minimum 30-inches below finish grade, unless noted otherwise.

7. Burial Depth – Primary Service: Minimum 48-inches below finish grade or as required by serving utility.

8. All underground raceways to be made water-tight with sealed threads or couplings.

9. Rigid Galvanized conduit shall be coated entire length with coal-tar material (Koppers Bitumastic 515) or with PVC jacket (15 mil. Minimum).
F. Penetrations, Seals & Plugs

1. All 90 degree ells and conduit entrances into buildings to be with rigid galvanized conduit. Coat with coal-tar material (Koppers Bitumastic 515)

2. Provide conduit seals at exits and entrances from hazardous locations (i.e. Chlorine storage or distribution rooms), freezer rooms and other locations as required by NEC Article 500.

3. Conduit penetrations of the electrical room walls and floor must “float” via backer rod or fiberglass and caulked air tights.

4. Provide conduit plugs at all raceway openings during roughing-in to prevent entrance of foreign matter.

5. Provide floor or wall entrance fittings at all points where raceways enter or exit below finish grade at tunnels, basements or trenches.

6. Any conduit leaving the building envelope (e.g., site lighting, roof mounted HVAC equipment, etc.) to be 3/4-inch minimum and must slope downward. Seal conduits at interior side of building. Pack non-hardening duct sealing mastic around wires in the raceway.

7. Provide wall or floor fire and smoke barriers to cut off all concealed draft openings (both vertical and horizontal) where raceways perforate fire walls.

8. Roof Penetrations:
   a. Provide roof-flashing assembly at locations where conduit pierces the roof.
   b. Locate conduit minimum six inches from roof curbs or flashing.
   c. Provide caulking compound between counter flashing and conduit for watertight seal.

G. Boxes

1. Verify location of all outlet boxes with actual field conditions and plans to avert possible installation conflicts. Architect or Engineer reserves the right to make minor changes prior to installation without cost to the Owner. Coordinate work with that of other trades.

2. Toe Spaces: Boxes for receptacle outlets in toe spaces to be mounted horizontally.

3. Above Counter: Boxes for devices above counter should be typically mounted vertically, however, due to unforeseen field modification in casework and backsplashes, please coordinate with the architect.

4. Extension rings: Do not add more than one to any box with maximum depth of box and extension ring not to exceed three inch unless specifically indicated otherwise.

3.02 Cleaning
A. Complete raceways system before pulling-in conductors.

B. Remove all foreign matter from raceways and blow out or vacuum smaller conduits and pull mandrel through larger conduits prior to installing conductors.

3.03 Painting
   A. All exposed conduits on painted walls to be painted to match wall and trim colors.

PART 4 - PAYMENT
4.01 Payment for Work.
   A. Payment for work under this Division shall be Lump Sum.

END OF SECTION
PART 1 - GENERAL

1.01 Description

A. Provide lighting fixtures of type and wattages indicated on Drawings by letter and number shown adjacent to lighting outlet symbol. A fixture typical for location is to be installed at every lighting outlet unless otherwise indicated.

B. Provide fixtures complete with lamps, ballasts, reflectors, diffusers, lenses, shielding, hangers, poles and accessories, concrete pole bases and fittings.

C. Related work in other sections includes:
   1. Providing concrete bases for poles, Division 03.
   2. Providing conductors and connectors, Section 26 0519, Conductors and Cables.
   3. Providing raceways and fittings, Section 26 0533, Raceways and Boxes.
   4. Providing fire rated enclosures at light fixtures.

1.02 Quality Assurance

A. UL listed or CSA certified for application.

1.03 Submittals

A. Submit a complete list of fixtures, lamps and ballasts with catalog numbers, manufacturer’s drawings, photographs or catalog sheets for approval prior to ordering fixtures. Submittal to be in accordance with Division 01 or 26 0500, Shop Drawings and Materials Lists (when included).

B. Submit operation and maintenance data in accordance with Division 01 or 26 0500, Electrical Equipment Maintenance Manuals (when included).

1.04 Product Delivery, Storage and Handling

A. Deliver fixture in manufacturer's original unopened packages with labels legible and intact.

B. Deliver with UL label and bearing manufacturer's name.

C. Deliver poles wrapped and protected from damage.

D. Store and handle so as not to subject materials to corrosion or mechanical damage and in manner to prevent damage from environment and construction operation.
PART 2 - PRODUCTS

2.01 General:

A. Fixture types: See light fixture schedule on drawings for fixture types and acceptable manufacturers.

B. Provide fixtures with ACL, damp or wet label if required for the applications indicated.

C. All recessed fixtures shall be free of light leaks.

2.02 Approved Manufacturers:

A. See Light Fixture Schedule on drawings for approved manufacturers and specifically approved products (models).

B. Listing of a manufacturer on the Light Fixture Schedule (or other Contract Documents) does not constitute the approval of a specific fixture model not otherwise specifically identified on the Light Fixture Schedule.

C. The supplier/contractor is responsible to provide approved light fixtures that meet the requirements as specified herein and on the drawings (Light Fixture Schedule, general and keyed notes, etc.).

D. Other manufacturer’s products submitted for approval must meet the aesthetic appearance and quality standards of the specific model listed as the basis of design. The contractor shall, at the discretion of the Engineer and/or Architect and at no cost to the Owner, replace any product deemed inferior to the specifically specified light fixture model.

2.03 LED (Light Emitting Diode):

A. LED manufacturer will include, but not be limited to, light source, luminaire, power supply and control interface with added components as needed for complete and functioning system.

B. Warranty: LED systems and complete luminaires must have a manufacturer’s warranty of 3 year from date of substantial completion.

C. Comply with ANSI chromaticity standard for classifications of color temperature. See luminaire schedule for specified LED lamp color and color temperature. UL or ETL listed and labeled.

D. Luminaire testing per IESNA LM-79 and LM-80 procedures.

E. Lamp life for white LEDs: 50,000 plus hours with lamp failure occurring when LED produces 70 percent of initial rated lumens.
F. Lamp life for color LEDs: 30,000 plus hours with lamp failure occurring when LED produces 50 percent of its initial rated lumens.

G. Provide shop drawings, with LED systems based on lumen output at 70 percent lumen depreciation for white LEDs and 50 percent lumen depreciation for color LEDs. Initial lumens for all colors of LEDs must be listed individually.

H. LED Drivers: reverse polarity protection, open circuit protection, require no minimum load. Minimum 80% efficiency. Class A noise rating.

I. LED light source manufacturers: Nichia, Cree, Osram/Sylvania, GE Lumination or approved.

2.04 Fixture mounting:

A. General: Provide all concrete pads and supports as required.

B. Poles:

1. Each pole shall have adequate strength and rigidity to withstand not less than 100 mph winds without damage to the poles and attached fixtures and lamps. Pole bases shall be equipped with handholes with matching covers, and base bolt covers. Contractor is responsible to provide adequately sized pole base (typically concrete) to support pole and fixture(s) for soil type and expected wind loading where installed.

2. Pole base shall comply with the following sections:

   a. Concrete, Division 03
   b. Reinforcing, Section 03 2000
   c. Grout, Section 03 6000

3. Anchor bolts shall be ¾” diameter by 24” long and shall conform to ASTM standard A-307 with double leveling nuts. Anchor bolts shall be hot-dip galvanized after fabrication and threads cleared. Nuts, washers, and other hardware and fittings shall be corrosion resistant alloy material of adequate strength. Indicated pole heights are above the top of the concrete base.

4. After the poles have been installed, shimmed and plumbed, grout the spaces between the pole bases and the concrete base with non-shrink concrete grout material.

PART 3 - EXECUTION

3.01 Inspection

A. Verify location, ceiling types and mounting requirements for each fixture prior to ordering fixtures.
3.02 Installation

A. Coordinate installation of fixtures with other subcontractors, and verify methods of hanging and supporting required.

B. All fixtures to be illuminated at time of acceptance.

C. Fixtures located in mechanical and store rooms to be coordinated with ductwork, piping and structural members. Adjust stems as required for proper illumination of the area.

D. All light outlets shall be supplied with a fixture. Outlet symbols on the drawings without a type designation shall have a fixture the same as those used in similar or like locations.

E. Poles
   1. Contractor is responsible to review site conditions and to coordinate any conflicts with overhead or underground Utilities. Under no conditions shall contractor install poles in violation of local utility clearance regulations or guidelines.
   2. Deliver mounting bolts and bolt rings for poles for casting into concrete bases.
   3. Construct foundation in accordance with the details as shown on the plans. Secure conduit ends and anchors to proper height with manufacturer’s recommended template until the concrete sets.
   4. Pole and anchor bolts shall be provided, and foundation constructed to withstand 100 mph basic, and 130 mph wind gust velocity for fixture location, soil conditions and fixture/pole wind loading.
   5. Forms shall be true to line and grade and held in place until concrete has set.
   6. Finish exposed concrete foundations shall have a smooth, neat appearance.
   7. Set poles straight and plumb and grout in around bases as required. At hinged base poles verify hinge position with Engineer.

3.03 Adjustment And Cleaning

A. Fixture supports shall provide proper alignment and leveling of fixtures.

B. Aim adjustable fixtures as directed by Architect or Engineer. Exterior fixtures should be adjusted for proper illumination of areas.
C. Clean all foreign matter from interior and exterior of fixtures and from exterior of poles, touch-up scratched or marred surfaces to match original finish.

3.04 Testing

A. Operate the complete exterior lighting system for seven (7) consecutive days. When the lighting performance is satisfactory to the Engineer, the system will be accepted.

PART 4 - PAYMENT

4.01 Payment for Work.

A. Payment for work under this Division shall be Lump Sum.

END OF SECTION
SECTION 31-1000
SITE CLEARING

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Clearing and protection of vegetation.
   B. Demolition of existing structures to be removed and Removal of existing debris.

1.02 RELATED REQUIREMENTS
   A. Section 01-5713 – Temporary Erosion and Sediment Control.
   B. Section 31-2200 – Grading.
   C. Section 31-2323 – Fill.

PART 2 PRODUCTS

2.01 MATERIALS
   A. Fill Material: As specified in Section 31-2323 - Fill and Backfill

PART 3 EXECUTION

3.01 SITE CLEARING
   A. Comply with other requirements specified in Section 01-7000 – Execution and Closeout
      Requirements.
   B. Minimize production of dust due to clearing operations; do not use water if that will result in ice,
      flooding, sedimentation of public waterways or storm sewers, or other pollution.

3.02 EXISTING UTILITIES AND BUILT ELEMENTS
   A. Coordinate work with utility companies; notify before starting work and comply with their
      requirements; obtain required permits.
   B. Protect existing utilities to remain from damage.
   C. Do not disrupt public utilities without permit from authority having jurisdiction.
   D. Protect existing structures and other elements that are not to be removed.
   E. Call for utility locates prior to digging and wait for location field marks.

3.03 VEGETATION
   A. Scope: Remove trees, shrubs, brush, and stumps in areas to be covered by paving, gravel
      shoulders, sidewalks, underground utilities, and other improvements shown on the Drawings.
   B. Do not begin clearing until vegetation to be relocated has been removed.
   C. Do not remove or damage vegetation beyond the limits indicated on drawings.
      1. 5 feet outside of construction limits.
      2. Exception: Specific trees and vegetation indicated on drawings to be removed.
      3. Exception: Selective thinning of undergrowth specified elsewhere.
   D. Install substantial, highly visible fences at least 3 feet high to prevent inadvertent damage to
      vegetation to remain:
      1. At vegetation removal limits.
      2. Around trees to remain within vegetation removal limits; locate no closer to tree than at the
         drip line.
      3. Around other vegetation to remain within vegetation removal limits.
   E. In areas where vegetation must be removed but no construction will occur other than pervious
      paving, remove vegetation with minimum disturbance of the subsoil.
   F. Vegetation Removed: Do not burn, bury, landfill, or leave on site, except as indicated.
      1. Chip, grind, crush, or shred vegetation for mulching, composting, or other purposes;
         preference should be given to on-site uses.
2. Trees: Sell if marketable; if not, treat as specified for other vegetation removed; remove stumps and roots to depth of 18 inches.
3. Existing Stumps: Treat as specified for other vegetation removed; remove stumps and roots to depth of 18 inches.
4. Fill holes left by removal of stumps and roots, using suitable fill material, with top surface neat in appearance and smooth enough not to constitute a hazard to pedestrians.
   a. Refer to Geotechnical Report for fill requirements under Building.
   b. Refer to Section 31-2323 – Fill for all other areas.
G. Dead Wood: Remove all dead trees (standing or down), limbs, and dry brush on entire site; treat as specified for vegetation removed.
H. Restoration: If vegetation outside removal limits or within specified protective fences is damaged or destroyed due to subsequent construction operations, replace at no cost to Owner.
   1. Refer to Section 32-9200 – Seeding and Section 32-9300 – Plants.

3.04 DEBRIS
   A. Remove debris, junk, and trash from site.
   B. Break up as required and remove existing concrete designated for removal.
   C. Leave site in clean condition, ready for subsequent work.
   D. Clean up spillage and wind-blown debris from public and private lands.

PART 4 PAYMENT

4.0 MEASUREMENT AND PAYMENT
   A. Payment for work under this Division shall be Lump Sum.
SECTION 31-2200
GRADING

PART 1 - GENERAL
1.01 SECTION INCLUDES
A. Removal of topsoil.
B. Rough grading the site for site structures.
C. Finish grading.

1.02 RELATED SECTIONS
A. Section 01-5713 – Temporary Erosion and Sediment Control
B. Section 32-2316 – Excavation.
C. Section 31-2316.13 – Trenching.
D. Section 31-2323 - Fill.
E. Section 32-1123 – Aggregate Base Courses.
F. Section 32-1216 – Asphalt Paving.
G. Section 32-1313 – Concrete Paving.

1.03 SUBMITTALS
A. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

PART 2 - PRODUCTS
2.01 SECTION INCLUDES
A. Topsoil: See Section 31-2323.
B. Other Fill Materials: See Section 31-2323.
C. Geotechnical Study and Report Salmon Harbor Marina R.V. Expansion, Winchester Bay, Oregon by Pinnacle Engineering, Inc., August 28, 2018

PART 3 - EXECUTION
3.01 EXAMINATION
A. Verify that survey benchmark and intended elevations for the Work are as indicated.
B. Verify the absence of standing or ponding water.

3.02 PREPARATION
A. Identify required lines, levels, contours, and datum.
B. Stake and flag locations of known utilities.
C. Locate, identify, and protect from damage above - and below - grade utilities to remain. Notify utility company to remove and relocate utilities.
D. Provide temporary means and methods to remove all standing or ponding water from areas prior to grading.
E. Protect site features to remain, including but not limited to, benchmarks, survey control points, existing structures, fences, sidewalks, paving, and curbs, from damage by grading equipment and vehicular traffic.

3.03 ROUGH GRADING
A. Remove topsoil from areas to be further excavated, re-landscaped, or re-graded, without mixing with foreign materials.
B. Do not remove topsoil when wet.
C. Remove subsoil from areas to be further excavated, re-landscaped, or re-graded.
D. Do not remove wet subsoil, unless it is subsequently processed to obtain optimum moisture content.
E. When excavating through roots, perform work by hand and cut roots with sharp axe.
F. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.
G. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack of surface water control.

3.04 SUB GRADING
A. Trim and shape the entire subgrade to be free of ruts, depressions and irregularities.
B. Compact all fills according to Section 31-2323 – Fill.
C. Finish the surface to within a tolerance of plus or minus 3/4 inch or as directed.

3.05 DITCHES
A. Remove all litter, debris, and obstructions.
B. Trim and shape to neat lines at all ditches, swales, channels, and canals provided for waterways.

3.06 FINISH GRADING
A. Before Finish Grading:
   1. Verify trench backfilling have been inspected.
   2. Verify subgrade has been contoured and compacted.
B. Remove debris, roots, branches, stones, in excess of 1/2 inch in size. Remove soil contaminated with petroleum products.
C. Place topsoil in areas indicated.
D. Place topsoil during dry weather.
E. Remove roots, weeds, rocks, and foreign material while spreading.
F. Near plants, spread topsoil manual to prevent damage.
G. Fine grade topsoil to eliminate uneven areas and low spots. Maintain profiles and contour of subgrade.
H. Lightly compact placed topsoil.
I. Maintain stability of topsoil during inclement weather. Replace topsoil in areas where surface water has eroded thickness below specifications.

3.07 TOLERANCES
A. Top Surface of Subgrade: Plus or minus 0.10 foot (1-3/16 inches) from required elevation.
B. Top Surface of Finish Grade: Plus or minus 0.04 foot (1/2 inch).

3.08 SLOPES
A. Remove all exposed roots, debris and all stones more than 2 inches in size which are loose or liable to be loosened.
B. Make embankment slopes as smooth, safe and sightly as practical with the materials used for embankment construction.
C. Trim and shape all excavation and embankment side slopes.

3.09 STRUCTURE SITES
A. Perform applicable work tasks from paragraphs 3.01 through 3.04 above.
B. Clean out all sanitary sewers, storm drains, culverts and their appurtenances constructed under the contract.
C. Remove all extraneous matter in the vicinity of culvert ends, inlets, walls and other areas.
D. Trim and shape the cleaned areas.

3.10 FIELD QUALITY CONTROL
A. See Section 31-2323 – Fill for compaction density testing.
B. Notify Project Coordinator immediately upon discovery of subsurface water.

3.11 CLEANING AND DISPOSAL OF MATERIALS
A. Dispose of all materials removed according to Section 01-7419 – Construction Waste Management and Disposal.
B. Remove unused stockpiled topsoil and subsoil. Grade stockpile area to prevent standing water.
C. Notify Project Coordinator immediately upon discovery of subsurface water.

PART 4 – PAYMENT
4.01 MEASUREMENT AND PAYMENT
A. Payment for work under this Division shall be Lump Sum.
SECTION 31-2316
EXCAVATION

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Excavating for building volume below grade, footings, and paving.
B. Other miscellaneous minor excavation as may be required.

1.02 RELATED REQUIREMENTS
A. Section 01-5713 - Temporary Erosion and Sediment Control: Slope protection and erosion control
B. Section 31-2200 – Grading
C. Section 31-2316.13 - Trenching: Excavating and backfill for utility trenches
D. Section 31-2319 – Dewatering
E. Section 31-2323 - Fill: Fill materials, filling, and compacting
F. Section 31-4100 – Shoring

1.03 PROJECT CONDITIONS
A. Verify that survey benchmark and intended elevations for the Work are as indicated.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION
3.01 PREPARATION
A. Identify required lines, levels, contours, and datum locations.
B. See Section 31-2200 - Grading for additional requirements.
C. Grade top perimeter of excavation to prevent surface water from draining into excavation. Provide temporary means and methods, as required, to maintain surface water diversion until no longer needed, or as directed by the Architect or Engineer.

3.02 EXCAVATING
A. Underpin adjacent structures that could be damaged by excavating work.
B. Excavate to accommodate new structures and construction operations.
C. Notify Architect or Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.
D. Slope banks of excavations deeper than 4 feet to angle of repose or less until shored.
E. Cut utility trenches wide enough to allow inspection of installed utilities.
F. Hand trim excavation. Remove loose matter.
G. Correct areas that are over-excavated and load-bearing surfaces that are disturbed; see Section 31-2323 - Fill.
H. Provide temporary means and methods, as required, to remove all water from excavations until directed by the Architect or Engineer.
I. Determine the prevailing groundwater level prior to excavation. If the proposed excavation extends less than 1 foot into the prevailing groundwater, control groundwater intrusion with perimeter drains routed to sump pumps, or as directed by the Architect or Engineer. If the proposed excavation extends more than 1 foot into the excavation, control groundwater intrusion with a comprehensive dewatering procedure, or as directed by the Geotechnical Engineer.
J. Remove excavated material that is unsuitable for re-use from site.
K. Stockpile excavated material to be re-used in area designated on site. See Section 31-2200.
L. Remove excess excavated material from site.
M. Keep excavation free from water.

3.03 PROTECTION
A. Divert surface flow from rains or water discharges from the excavation.
B. Prevent displacement of banks and keep loose soil from falling into excavation; maintain soil stability.
C. Protect open excavations from rainfall, runoff, freezing groundwater, or excessive drying so as to maintain foundation subgrade in satisfactory, undisturbed condition.
D. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.
E. Keep excavations free of standing water and completely free of water during concrete placement.
F. Keep excavations free from water through dewatering as required.

PART 4 PAYMENT
4.01 MEASUREMENT AND PAYMENT
A. Payment for work under this section shall be Lump Sum.

END OF SECTION
SECTION 31-2316.13
TRENCHING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Backfilling and compacting for utilities outside the building to utility main connections.

B. This section consists of furnishing all labor, materials, incidentals and equipment, as well as performing all work required for excavation, foundation stabilization, pipe bedding, pipe zone material, trench backfill, compaction, final grading, hauling and disposal of material resulting from the construction of utility piping, and all related appurtenances. Included also is the locating and protecting of existing utilities and other improvements (see Division 1), shoring, and bracing, excepting only such work as is covered and included under other sections of this Division, or other Divisions of these Contract Documents.

C. Excavation must be in accordance with ORS 757.542 to 757.562 Utility Notification, and all other applicable laws and regulations.

1.02 RELATED REQUIREMENTS

A. Section 31-2200 - Grading: Site grading.

B. Section 31-2316 - Excavation: Excavation other than trench excavation.

C. Section 31-2319 - Dewatering.

D. Section 31-2323 - Fill.

E. Section 31-4100 - Shoring.

1.03 DEFINITIONS

A. Trench Excavation - Trench excavation consists of the removal of all material encountered in the trench to the limits shown on the Plans or as directed. Trench excavation shall be classified as unclassified excavation.

   1. Unclassified excavation is defined as the removal of all material as required to complete the planned improvements, regardless of type, nature or condition of materials encountered.

B. Trench Foundation - Trench foundation is defined as the bottom of the trench on which the pipe bedding is to lay and which provides support for the pipe.

C. Foundation Stabilization - Foundation stabilization is defined as the furnishing, placing and compacting of specified materials for any unsuitable material removed from the bottom of an excavation, as directed by the Engineer, to provide a firm trench foundation.

D. Pipe Bedding - Pipe bedding is defined as the furnishing, placing and compacting of specified materials on the trench foundation so as to uniformly support the barrel of the pipe. The total bedding depth shall be as shown on the Contract Drawings.

E. Pipe Zone - Pipe zone is defined as the furnishing, placing and compacting of specified materials for the full width of the trench and extending from the top of the bedding to a level above the top outside surface of the barrel of the pipe as shown on the Contract Drawings.

F. Trench Backfill - Trench backfill is defined as the furnishing, placing and compacting of material in the trench extending from the top of the pipe zone to the bottom of pavement base, ground surface or surface material. Plans generally show locations for each type of backfill class.
1.04 REFERENCE STANDARDS
   A. Use current adopted addition(s).

1.05 SUBMITTALS
   A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
   B. Samples: 10 lb sample of each type of fill; submit in air-tight containers to testing laboratory.
      Submit at least 2 weeks in advance of use.
   C. Materials Sources: Submit name of imported materials source.
   D. Compaction Density Test Reports.

1.06 DELIVERY, STORAGE, AND HANDLING
   A. When necessary, store materials on site in advance of need.
   B. When fill materials need to be stored on site, locate stockpiles where designated.
      1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
      2. Prevent contamination.
      3. Access to all fire hydrants, water valves and meters shall be maintained. Stockpiles shall
         not be permitted to block any stormwater drainage ditches, gutters, drain inlets, culverts
         or natural water courses.
      4. Protect stockpiled material which is to be later incorporated into the work so that
         excessive wetting or drying of the material does not occur. Material shall be brought to
         near optimum moisture content prior to placement and compaction. Depending on the
         moisture content of stockpiled materials, necessary processing may include aeration,
         mixing and/or wetting. No additional payment will be allowed for protecting or preparing
         native backfill materials.
      5. If approved native materials become unsuitable (too wet or mixed with unsuitable
         materials) due to negligence by the Contractor, then imported granular materials may be
         required for backfilling at the subject location at no additional cost to the Owner.
      6. Comply with all requirements of the 1200-C Construction Stormwater Permit (secured by
         Owner).
      7. Protect stockpiles from erosion and deterioration of materials. Provide necessary
         protection so that silt-laden runoff does not occur and to prevent wind blown dust.

PART 2 - PRODUCTS

2.01 TRENCH FILL MATERIALS
   A. Trench Foundation - The trench foundation shall be undisturbed native material when suitable.
      Where ground water or other unstable conditions exist and the native material cannot properly
      support the pipe, additional excavation may be required. The trench shall be stabilized with
      foundation stabilization material when such conditions are present in the opinion of the
      Engineer.
   B. Foundation Stabilization - Foundation Stabilization: 2 1/2"-0, 2"-0, or 1 1/2"-0 dense graded
      aggregate base rock meeting OSS Sections 00641 and 02630. Required when native trench
      foundation material contains groundwater, or is unsuitable to provide a firm foundation in the
      opinion of the Engineer.
   C. Pipe Bedding - Material for pipe bedding shall be clean, hard, sound, durable, well-graded,
      3/4"-0 or 1"-0 crushed rock, free from organic matter meeting OSS Section 02630.10. Engineer
      must approve material prior to use.
D. Pipe Zone – If groundwater is present in the bedding zone, use 3/4"-0 Aggregate bedding. If groundwater is not present, and unless otherwise specified, furnish one of the following materials for bedding the pipe:
   1. 3/8"-0 PCC fine Aggregate conforming to 02690.30(h).
   2. Commercially available 3/4"-0 Aggregate.
   3. No. 10 - 0 sand drainage blanket material conforming to 00360.10.
   4. Reasonably well-graded, from maximum size to dust, sand with 100 percent passing the 3/8 inch sieve.
   5. Commercially available 3/8"-0 or No. 10 - 0 sand.

E. Trench Backfill
   1. Class "A" Backfill: Native or common excavated material, free from organic or other deleterious material, free from rock larger than 2-inches, and which meets the characteristics required for the specific surface loading or other criteria of the backfill zone in the opinion of the Engineer. If stockpiled material becomes saturated or unsuitable, Class B, C or D Backfill shall be substituted. Engineer must approve material prior to use.
   2. Class "B" Backfill: 1"-0 or 3/4"-0 dense-graded aggregate meeting OSS Section 02630.10.
   3. Class "C" Backfill: Clean sand with no particles larger than 1/4-inch.
   4. Class "D" Backfill: 1 1/2" - 3/4" open graded, durable free draining, crushed coarse drain backfill, conforming to OSS 00430.1. Drain backfill shall contain no fines or round rock.
   5. Class "E" Backfill (CLSM or CDF): Controlled Low-Strength Material (cement slurry) conforming to OSS Section 00442.
      a. Slurry shall consist of a highly flowable lean concrete mix; mixture of Portland cement, fly ash, fine aggregates, water and admixtures as required for a mixture that results in a hardened, dense, non-settling, hand excavatable fill.

PART 3 - EXECUTION
3.01 EXAMINATION
   A. Verify that survey benchmarks and intended elevations for the work are as indicated.

3.02 PREPARATION
   A. Identify required lines, levels, contours, and datum locations.
   B. Clearing and Grubbing and removal of obstructions to be completed prior to excavation.
   C. Incidental to excavation shall be the furnishing, installing and removal of all shoring, sheeting, bracing as required to support adjacent earth banks and structures, keep excavations free from water, and to provide for the safety of the public and all personnel working in excavations.
   D. Locate, identify, and protect utilities that remain and protect from damage.
   E. Saw-cut existing pavements where required to proper limits in clean and straight lines as required.
   F. Notify utility company for new services and/or removal and relocation of existing utility connections.
   G. Protect benchmarks, survey control points, existing structures, fences, sidewalks, paving, curbs, and service connections to remain from excavating equipment and vehicular traffic.
   H. Protect plants, lawns, rock outcroppings, and other features to remain.
I. Grade top perimeter of trenching area to prevent surface water from draining into trench. Provide temporary means and methods, as required, to maintain surface water diversion until no longer needed, or as directed by the Architect.

J. Coordinate and provide all utility locates prior to any excavation as required by local, state and federal laws and regulations. When the precise location of subsurface structures and/or utilities is unknown, locate such items by hand excavation prior to utilizing mechanical excavation equipment. Use hand excavation when mechanical equipment might damage existing improvements which are to remain undisturbed. See Division 01 for other requirements.

3.03 TRENCHING

A. Notify Architect or Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

B. Slope banks of excavations deeper than 4 feet to angle of repose or less until shored.

C. Do not interfere with 45 degree bearing splay of foundations.

D. Cut trenches wide enough to allow inspection of installed utilities.

E. Hand trim excavations. Remove loose matter.

F. Remove large stones and other hard matter that could damage piping or impede consistent backfilling or compaction.

G. Remove, haul, and dispose of all formations and materials, natural or man-made, irrespective of nature or conditions encountered, within lines and grades shown on the Plans or defined herein, and as necessary for completion of the proposed improvements. The method of excavation shall be as determined by the Contractor, and as required for special protection of existing improvements. Special care shall be taken to avoid overexcavation below subgrades. Store and protect materials suitable for use as backfill where applicable.

H. Remove excavated material that is unsuitable for re-use from site.

I. Remove excess excavated material from site.

J. Provide temporary means and methods, as required, to remove all water from trenching until directed by the Architect. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack of dewatering or surface water control.

K. Determine the prevailing groundwater level prior to trenching. If the proposed trench extends less than 1 foot into the prevailing groundwater, control groundwater intrusion with perimeter drains routed to sump pumps, or as directed by the Architect.

L. Excavate to the lines and grades shown on the project Plans, allowing for forms, shoring, working space and bedding. Provide a minimum clearance around pipe barrel in all directions or greater in accordance with the standard trench detail drawing.

M. Shoring and Bracing
   1. Sheet and brace excavation as necessary to prevent caving and to protect adjacent structures, property, workers and the public.
   2. The design, planning, installation and removal of all sheeting, shoring, sheet piling, lagging and bracing shall be accomplished in such a manner as to maintain the required excavation or trench section and to maintain the undisturbed state of the soil below and adjacent to the excavation.
   3. Horizontal strutting below the barrel of a pipe and the use of pipe as support are not acceptable.
4. All sheeting, shoring and bracing shall conform to safety requirements of OSHA and other Federal, State and local agencies.

3.04 PREPARATION FOR UTILITY PLACEMENT

A. Cut out soft areas of subgrade not capable of compaction in place. Backfill with specified Foundation Stabilization Material.

B. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

C. Until ready to backfill, maintain excavations and prevent loose soil from falling into excavation.

D. In undisturbed soils or rock when, in the opinion of the Engineer, the trench foundation materials are not suitable for the support of the pipe. Foundation Stabilization materials, as specified, shall be placed and compacted in lifts not exceeding 6-inches in compacted thickness to the required grade. Each lift shall be compacted to at least 95% of the maximum dry density in accordance with ASTM D698.

3.05 BACKFILLING

A. Backfill to contours and elevations indicated using unfrozen materials.

B. Fill up to subgrade elevations unless otherwise indicated.

C. Employ a placement method that does not disturb or damage other work.

D. Do not fill over porous, wet, frozen or spongy subgrade surfaces.

E. Maintain optimum moisture content of fill materials to attain required compaction density. Before placing the material, condition, aerate, or wet the material so that the moisture content of each layer is within minus 4 percent to plus 2 percent of optimum moisture content.

F. Place and compact pipe bedding material before placing pipe in the trench. Dig depression for pipe bells to provide uniform bearing along the entire pipe length. Thoroughly compact bedding material in accordance with ASTM D698/AASHTO T99 as shown in the table below, or in Geotechnical Report recommendations:

<table>
<thead>
<tr>
<th>Layer</th>
<th>Compaction</th>
<th>Uncompact layer depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipe Zone &amp; Bedding</td>
<td>90%</td>
<td>6”</td>
</tr>
<tr>
<td>Class B (aggregate)</td>
<td>92%</td>
<td>12”</td>
</tr>
<tr>
<td>Class C (sand)</td>
<td>95%</td>
<td>12”</td>
</tr>
</tbody>
</table>

G. Granular and Soil Fill: Place and compact materials in equal continuous layers not exceeding 8 inches compacted depth.

H. Place materials in the pipe zone in a manner that equalizes the pressure on the pipe and minimizes stress. As required under the haunches of pipe and areas not accessible to mechanical tampers or to testing, compact with hand methods to ensure thorough contact between the material and the pipe.

I. Backfill the trench above the pipe zone in successive lifts not exceeding 8-inches in loose thickness. Do not allow the backfill to free-fall into the trench until at least 3 feet of cover is provided over the top of the pipe. Each lift shall be compacted, using suitable mechanical or pneumatic equipment, as per table shown above. If the specified compaction is not obtained, the Contractor may be required to use a modified compaction procedure and/or reduce the thickness of lifts. If approved materials meeting the specifications cannot be compacted to the required density regardless of compactive effort or method, the Engineer may reduce the required density or direct that alternate materials be used. In no case shall excavation and pipe
laying operations proceed until the Contractor is able to compact the backfill to the satisfaction of the Engineer.

J. CLSM. When CLSM Backfill is required, backfill above pipe zone with CLSM material. If the CLSM is to be used as a temporary surfacing, backfill to top of the trench and strike off to provide a smooth surface. If CLSM is not to be used as a temporary surface, backfill to bottom of the proposed resurfacing. Use steel plates to protect the CLSM from traffic a minimum of 24 hours.

K. When backfilling is complete, the Contractor shall finish the surface area as specified. In paved or graveled areas the Contractor shall maintain the surface of the trench backfill level with existing adjacent grades with 3/4"-0 crushed rock until pavement replacement is completed and accepted by Owner.

L. Correct areas that are over-excavated.
   1. Thrust bearing surfaces: Fill with concrete.
   2. Other areas: Use specified Foundation Material, compacted to minimum 95 percent of maximum dry density.

M. Reshape and re-compact fills subjected to vehicular traffic.

3.06 FIELD QUALITY CONTROL
A. Perform compaction density testing on compacted fill in accordance with ASTM D1556, ASTM D2167, or ASTM D6938.
B. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D1557 ("modified Proctor"), AASHTO T 180, or ASTM D698 ("standard Proctor").
C. Frequency of Tests:

<table>
<thead>
<tr>
<th>Class</th>
<th>Tests/LF of Trench</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2 tests/100 LF</td>
</tr>
<tr>
<td>B</td>
<td>1 test/300 LF</td>
</tr>
<tr>
<td>C</td>
<td>2 tests/100 LF</td>
</tr>
</tbody>
</table>

3.07 CLEANING
A. Leave unused materials in a neat, compact stockpile.
B. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.
C. Leave borrow areas in a clean and neat condition. Grade to prevent standing surface water.

PART 4 - PAYMENT

4.01 UNCLASSIFIED TRENCH EXCAVATION AND BACKFILL
A. Payment for Trench Excavation, Shoring, hauling excavated material, Bedding, Pipe Zone, and Backfill shall be included within the unit prices for piping, manholes or other structures, service laterals and all associated appurtenance items. Price will include all such work and materials required for each backfill class and size and type of pipe as shown in the Bid Form. A separate payment will not be made for these items.
B. Where granular backfill material is used within gravel shoulders and gravel roadways, the backfill shall be brought to the finish grade of the existing shoulder and/or gravel roadway and
shall be included in the unit prices for piping. A separate payment for surfacing gravel will not be made in such cases.

C. Payment for trench excavation and backfill shall include all work specified herein, which is not specifically paid for in other pay items.

4.02 FOUNDATION STABILIZATION

A. Payment for foundation stabilization will be made on a cubic yard basis. The volume will be based on trip ticket truck measure, furnished Engineer upon delivery and incorporated into work. A maximum compaction and loss allowance of 30 percent will be allowed between excavation and gravel foundation stabilization quantities. Should quantities exceed this allowance, the pay quantities will be computed upon the following basis for length, width and depth of trench:

1. Length. The length will be the entire horizontal distance on a linear foot basis along the centerline of the trench, including measurement through manholes, pipe fittings or other structures, except that the measurement through such structures or fittings will be deducted if the proposal carries a separate item of structure excavation that is applicable to the structure.

2. Width. The width upon which trench foundation stabilization will be calculated shall be the inside diameter of the pipe plus 20 inches.

3. Depth. The depth measure will be the actual depth placed as directed below the level of the bottom of bedding. The depth will be measured at intervals of 50 feet along the centerline of the trench, and the average depth between measuring points will be the depth used for computing the depth of trench foundation stabilization between the measure points.

B. Payment for this item shall constitute full compensation for all work necessary to furnish materials at trench side; for placing and compacting it in the trench; and for the extra depth of trench excavation required below the pipe bedding grade to provide a stable foundation for the pipe.
SECTION 31-2319
DEWATERING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Controlling surface water runoff, dewatering pipeline trenches and structural excavations and other elements required for control of water if work conditions should dictate the need.

1.02 RELATED SECTIONS

A. Section 31-2316 – Excavation.
B. Section 31-2316.13 - Trenching.
C. Section 31-2323 – Fill.
D. Section 31-4100 - Shoring.

1.03 SUBMITTAL

A. Prior to commencing excavation, the Contractor shall submit a statement of the method, installation and details of proposed dewatering system to Engineer. The statement shall also include disposal.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Materials and equipment required for control of water shall be furnished and maintained as required to perform the construction.

PART 3 - EXECUTION

3.01 GENERAL

A. The necessary machinery, appliances and equipment shall be provided and operated to keep excavations free from water during construction, and to dispose of the water so as not to cause injury to public or private property or to cause a nuisance or a menace to the public. Sufficient pumping equipment and machinery in good working condition shall be provided for all emergencies including power outage, and sufficient workers shall be available at all times for the operation of the pumping equipment.

B. The dewatering system shall not be shut down between shifts, on holidays or weekends or during work stoppages without written permission from the Architect or Engineer.

3.02 CONTROL OF WATER

A. Control of groundwater such that softening of the bottom of excavations, or formation of “quick” conditions or “boils” during excavation, shall be prevented. Dewatering systems shall be designed and operated so as to prevent removal of the natural soils. Natural or compacted soils softened by saturation with groundwater or standing surface water shall be removed and replaced as instructed by the Engineer at no additional expense to the Owner.

B. During construction of structures, installation of pipelines, placing of structure and trench backfill and the placing and setting of concrete, excavations shall be kept free of water. Surface runoff shall be controlled so as to prevent entry or collection of water in excavations. The static water level shall be drawn a minimum of one foot below the bottom of the excavation, except two feet below the bottom of excavations for structures, so as to maintain the undisturbed state of the foundation soils and allow the placement of fill or backfill to the required density. The dewatering system shall be installed and operated so that the groundwater level outside the excavation is not reduced to the extent that would damage or endanger adjacent structures or property.

C. The release of groundwater to its static level shall be performed in such a manner as to maintain the undisturbed state of the natural foundation soils, prevent disturbance of compacted backfill and prevent flotation or movement of structures and pipelines. Underdrain systems and hydrostatic relief valves shall be operational prior to release of groundwater.
D. The Contractor shall not obstruct any component of the existing storm drain system but shall use proper measures to provide for the free passage of surface water.

E. Provisions shall be made to take care of surplus water, mud, silt, or other runoff pumped from excavations and trenches or resulting from sluicing or other operations. Siltation of completed or partially completed structures and pipelines by surface water or by disposal of water from dewatering operations shall be cleaned up at the Contractor’s expense.

F. Discharge of ground and surface runoff water shall be to the existing drainage ways and storm systems. Contractor shall comply with all applicable federal, state and local laws and regulations pertaining to erosion control and discharge of water off-site.

G. The Contractor shall be responsible for any damages to existing on- and off-site facilities and work in-place resulting from mechanical or electrical failure of the dewatering system.

H. Pumping of native silts and sands shall be avoided.

PART 4 - MEASUREMENT AND PAYMENT

4.01 DEWATERING

A. All labor, materials, equipment, temporary measures, and all other Work associated with excavation and trench dewatering for the entire Project will be considered as incidental.

B. No separate measurement and/or payment will be made for any/all work and items specified or required by this Section. All requirements of this Section are considered incidental to the project and shall be fulfilled by Contractor(s) working on the project, with no additional cost to the Owner.

END OF SECTION
SECTION 31-2323
FILL

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Filling, backfilling and compacting for building volume below grade, footings, pile caps, slabs-on-grade, paving, site structures, utilities within the building, and other areas as noted in Drawings.
B. Backfilling and compacting for utilities outside the building and paving areas and as shown in drawings.

1.02 RELATED REQUIREMENTS
A. Section 01-5713 - Temporary Erosion and Sediment Control: Slope protection and erosion control
B. Section 31-2200 - Grading: Site grading
C. Section 31-2316 - Excavating: Removal and handling of soil to be re-used
D. Section 31-2316.13 - Trenching: Excavating and Fill for utility trenches
E. Section 31-2319 - Dewatering
F. Section 32-1123 - Aggregate Base Course
G. Section 32-1216 - Asphalt Paving
H. Section 32-1313 - Concrete Paving

1.03 DEFINITIONS
A. Finish Grade Elevations: Indicated on Drawings.

1.04 REFERENCE STANDARDS
A. Use current adopted addition(s).

1.05 SUBMITTALS
A. See Section 01-3000 – Administrative Requirements.
B. Samples: 10 pounds sample of each type of fill; submit in air-tight containers to testing laboratory.
C. Materials Sources: Submit name of imported materials source.
D. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used, including manufactured fill.
E. Compaction Density Test Reports.

1.06 DELIVERY, STORAGE, AND HANDLING
A. When necessary, store materials on site in advance of need.
B. When fill materials need to be stored on site, locate stockpiles where indicated.
   1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
   2. Prevent contamination.
   3. Protect stockpiles from erosion and deterioration of materials.

PART 2 - PRODUCTS

2.01 FILL MATERIALS
A. General Fill - Class A: Use native or common material excavated from within limits of the project, free from vegetation and other detrimental material and containing no frozen
ground. Maximum particle size shall be 3 inches. Architect/Engineer will make approval prior to placement. Compact to at least 95 percent of the maximum dry density, as determined by ASTM D 698/AASHTO T99.

B. Granular Fill - Class B: Use high quality dense-grade 1"-0 or 3/4"-0" inch crushed rock, with less than 5 percent passing the U.S. Standard No. 200 sieve, compact to at least 95 percent of the maximum dry density, as determined by ASTM D 698/AASHTO T99. Gradation shall conform to Section 02630 of ODOT/APWA 2018 Oregon Standard Specifications for Construction.

C. Structural Fill: Use high quality, clean, dense-grade 1-1/2"-0" inch crushed rock conforming to Section 02630 of ODOT/APWA 2018 Oregon Standard Specifications for Construction. Compact to at least 95 percent of the maximum dry density, as determined by ASTM D 1557.

D. Sand - Class C: Use natural river or bank sand; free of silt, clay, loam, friable or soluble materials, and organic matter.

E. Drainrock Fill - Class D: Use granular permeable material; coarse, clean, free drain open graded 1-1/2" to 3/4" crushed rock containing no fines or round rock.

F. Class E

1. Use controlled low strength material (CLSM), a highly flowable lean concrete mix; a mixture of fly ash, Portland cement, fine aggregates and water which results in a harden, dense, non-settling fill and is excavatable. CLSM shall conform to Section 00420 of the ODOT/APWA 2008 Standard Specification for Construction as modified hereafter.

2. Mix Design Parameters.
   a. CLSM shall attain a 28 day compressive strength of 150 to 250 psi per ASTM C 39.
   b. CLSM slump shall be a maximum of 6 inches per ASTM C 143.
   c. Type II Portland cement conforming to ASTM C 150.
   d. Aggregate shall be fine aggregates conforming to ASTM C 33. Tests for size and grading shall be in accordance with ASTM C 136.
   e. Fly ash shall be Class F conforming to ASTM C 618 or Class N, natural pozzolana.
   f. Water shall be free from oil and deleterious amounts of acids, alkalies and organic materials.

G. Amended Topsoil - Class F: Amended topsoil excavated on-site or from borrow

1. Unclassified
2. Graded
3. Free of roots, rocks larger than 1/2 inch, subsoil, debris, large weeds and foreign matter
4. Acidity range (pH) of 5.5 to 7.5
5. Containing a minimum of 4 percent and a maximum of 25 percent inorganic matter
6. Soil amendment: See Drawings

2.02 ACCESSORIES


1. Flow Rate (ASTM D 4491): 110 gal/min/sf.
3. Grab Strength (ASTM D 4632): 100 lbs. minimum
4. Grab Elongation (ASTM D 4632): 50%.
5. Amoco Style 4546 or equal

B. Geotextile Filter Fabric: Same as above.
PART 3 - EXECUTION

3.01 EXAMINATION
A. Identify required lines, levels, contours, and datum locations.
B. Verify areas to be filled are not compromised with surface or ground water.
C. See Section 31-2200 - Grading for additional requirements.

3.02 PREPARATION
A. Scarify to a depth of 6 inches, compact, and then proof roll subgrade surface to identify soft spots.
B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with Fill Class B. See Geotechnical Study and Report for this project.
C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.
D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

3.03 FILLING
A. Fill to contours and elevations indicated using unfrozen materials.
B. Employ a placement method that does not disturb or damage other work.
C. Systematically fill to allow maximum time for natural settlement. Do no fill over porous, wet, frozen or spongy subgrade surfaces.
D. Maintain optimum moisture content of fill materials to attain required compaction density.
E. Granular Fill: Place and compact materials in equal continuous layers not exceeding 8 inches compacted depth.
F. Soil Fill: Place and compact material in equal continuous layers not exceeding 8 inches compacted depth.
G. Slope grade away from building minimum 2 inches in 10 ft, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.
H. Correct areas that are over-excavated.
   1. Load-bearing foundation surfaces: Use structural fill, flush to required elevation, compacted to 95 percent of maximum dry density.
   2. Other areas: Use Fill Class B, flush to required elevation, compacted to minimum 95 percent of maximum dry density.
I. Compaction Density Unless Otherwise Specified or Indicated:
   1. Under paving, slabs-on-grade, structural slabs on grade, and similar construction: 95 percent of maximum dry density.
J. Reshape and re-compact fills subjected to vehicular traffic.
K. Maintain temporary means and methods, as required, to remove all water while fill is being placed as required, or until directed by the Architect or Engineer. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack of dewatering or surface water control.

3.04 FILL AT SPECIFIC LOCATIONS
A. Use Class B fill unless otherwise specified or indicated.
B. Over Sub-Drainage Piping at drainage areas as shown in Drawings:
   1. Use Class D Fill and geotextile fabric: Section 31-2323 - Fill.
   2. Cover drainage fill with Class D Fill.
   3. Compact to 95 percent of maximum dry density.
C. At Lawn Areas and other Planting Areas:
   1. Use Class F Fill.
   2. Compact to 65 percent of maximum dry density.
3. See Section 31-2200 - Grading for topsoil placement.

3.05 TOLERANCES
A. Top Surface of General Filling: Plus or minus 1/2 inch from required elevations.
B. Top Surface of Filling Under Paved Areas: Plus or minus 1/4 inch from required elevations.

3.06 FIELD QUALITY CONTROL
A. See Section 01-4000 - Quality Requirements, for general requirements for field inspection and testing.
B. Perform compaction density testing on compacted fill in accordance with ASTM D 1556, ASTM D 2167, or ASTM D 6938.
C. When using the nuclear method of ASTM D 6938, the gauge shall be field calibrated according to ASTM standards.
D. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 698 (“standard Proctor”).
E. If tests indicate work does not meet specified requirements, remove work, replace and retest.
F. For “Structural Fill” evaluate results in relation to compaction curve determined in accordance with ASTM D 1557 (“modified Proctor”).
G. Frequency of Tests: For structural fill, tests shall be taken each day of production.

3.07 CLEANING
A. See Section 01-7419 - Construction Waste Management & Disposal, for additional requirements.
B. See Section 01-7000 – Execution and Closeout Requirements for additional requirements.
C. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

PART 4 – PAYMENT
4.01 MEASUREMENT AND PAYMENT
A. Fill shall be considered incidental to the unit price pay items for types of excavation, and/or fills. It being understood that, no separate payment for fills will be made.
SECTION 31-3700
RIPRAP OR ROCK LINING

PART 1 GENERAL
1.01 SECTION INCLUDES
  A. Placement of hand-placed riprap.

1.02 RELATED REQUIREMENTS
  A. Section 31-1000 - Site Clearing.
  B. Section 31-2200 - Grading
  C. Section 31-2316 - Excavating.
  D. Section 31-2319 - Dewatering.
  E. Section 31-2323 - Fill.
  F. Section 31-4100 - Shoring.

1.03 REFERENCE STANDARDS
  A. Use current adopted addition(s).

1.04 SUBMITTALS
  A. See Section 01-3000 – Administrative Requirements.
  B. Materials Sources: Submit name of imported materials source.
  C. Product Data and Testing Results: Submit Testing Reports.

PART 2 PRODUCTS
2.01 AGGREGATE
  A. Durable, angular, hard stone free from seams and cracks.
  B. Graded in size to produce a reasonable dense mass.
  C. Stone used for riprap shall conform to Oregon Standard Specifications (OSS) – The Oregon Department of Transportation, ODOT/APWA Oregon Chapter Standard Specifications for Construction; 2018, Section 00390 Riprap Protection.
  D. Gradation. Stone shall be 7" - 1" crushed quarry rock uniformly graded without fines.

2.02 SOURCE QUALITY CONTROL
  A. Aggregate: Wear not greater than 40 percent when tested per ASTM C535.

PART 3 EXECUTION
3.01 PREPARATION
  A. Remove all brush, trees, stumps, and other objectionable materials and dress area to a smooth surface. Make excavation to provide a firm foundation and protect against undercutting. Secure approval prior to backfilling.
  B. Correct irregularities in substrate gradient and elevations by scarifying, reshaping, re-compacting as necessary.

3.02 HAND-PLACED RIPRAP
  A. Place and bed the rocks, one against the other, and key together. Fill irregularities between stones with sizable size spalls.
  B. Place so that finished surface or riprap is even, tight, and true to line and grade. Extend riprap sufficiently below ground surface to secure a firm foundation.
  C. Do not place on soft, muddy, or frozen surfaces.
3.03 LOCATION
   A. Culvert daylighted pipe ends and as shown on Drawings. Place one layer thick and conceal
      with topsoil fill.
   B. Sloped grade at retaining wall at swale: Place as shown on Drawings prior to finish topsoil.

PART 4 – PAYMENT

4.01 MEASUREMENT AND PAYMENT
   A. Riprap or Rock Lining shall be Lump Sum.

END OF SECTION
SECTION 31-4100
SHORING

PART 1 - GENERAL

1.01 SECTION INCLUDES
   A. Shoring and bracing of trenches and other excavation as required to furnish safe and acceptable working conditions, protect existing and new structures, utilities, vegetation and maintaining existing slopes, fills and open excavations.
   B. The Contractor shall have sole responsibility to determine the construction means and methods required to satisfy the requirements of this section. The method of shoring and bracing may include the use, or the combination of sheeting, shoring, bracing, sloping, sliding trench shield or other methods to accomplish the work.
   C. Shoring and bracing shall also include other means and procedures such as draining and recharging groundwater and routing and disposing of surface runoff, required to maintain the stability of soils.

1.02 RELATED SECTIONS
   A. Section 31-2316.13 - Trenching
   B. Section 31-2319 - Dewatering

1.03 QUALITY ASSURANCE
   A. The method of protection shall be according to the Contractor’s design.
   B. The Contractor shall design sheeting, shoring, bracing, etc. in accordance with Oregon Occupational Safety and Health Act (OSHA).
   C. The Contractor’s design shall furnish a safe place of work pursuant to OSHA provisions of 1970 and the subsequent amendments and regulations and provide for protection of the work, structures and other improvements.

1.04 SHORING AND BRACING SAFETY PLAN
   A. For trenches and excavations 5 feet or more in depth, the Contractor shall have a detail plan design of sheeting, shoring, bracing, sloping, etc., available at the work site for review by the Engineer and OSHA representative, to be made for worker protection from hazards of caving ground.

1.05 CONTRACTOR’S SUPERVISOR
   A. The Contractor shall appoint a qualified supervisor, who shall be responsible for determining the shoring system that shall be used, depending on local soil type, water table, and so on.
   B. This supervisor shall have experience in the direction of such excavation and shoring work.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 GENERAL
   A. Shoring and bracing shall be installed and maintained continuously and not be limited to normal working hours.
   B. The construction of sheeting, shoring and bracing shall not disturb the state of soil adjacent to the trench of excavation or below the excavation bottom. Sheetin, shoring and bracing shall be removed after placement and compaction of initial backfill except otherwise specified.

3.02 STRUCTURE AND EXISTING PIPING
   A. The Contractor shall provide support of existing and new structures where necessary. Existing piping shall be protected with shoring and bracing where excavation could expose the pipe and/or cause damage to the pipe.
3.03 DAMAGES
   A. Any damages to new or existing structures occurring through settlements, water or earth pressures, or other causes due to failure or lack of sheeting, shoring or bracing, or through negligence or fault of the Contractor shall be repaired by the Contractor at their own expense.

PART 4 - MEASUREMENT AND PAYMENT

4.01 SHORING
   A. No separate measurement and/or payment will be made for any/all work and items specified or required by this Section. All requirements of this Section are considered incidental to the project and shall be fulfilled by Contractor(s) working on the project, with no additional cost to the Owner.

END OF SECTION
SECTION 32-1123
AGGREGATE BASE COURSES

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Aggregate base course.
B. Paving aggregates.

1.02 RELATED REQUIREMENTS
A. Section 31-2316.13 - Trenching: Compacted fill over utility trenches under base course.
B. Section 32-1216 - Asphalt Paving: Binder and finish asphalt courses.

1.03 REFERENCE STANDARDS
A. Use current adopted addition(s).

1.04 SUBMITTALS
A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
B. Samples: 10 lb sample of each type of aggregate; submit in air-tight containers to testing laboratory.
C. Materials Sources: Submit name of imported materials source.
D. Compaction Density Test Reports.

1.05 DELIVERY, STORAGE, AND HANDLING
A. Aggregate Storage, General:
   1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
   2. Prevent contamination.
   3. Protect stockpiles from erosion and deterioration of materials.

PART 2 PRODUCTS
2.01 MATERIALS
A. Aggregate Fill, Class B - Roadways, Curbs, Sidewalks, ¾” or 1”-0 Dense-graded Aggregate, Oregon Highway Department Standard; ODOT/APWA Oregon Standards Specifications (OSS) Section 02630.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that survey benchmarks and intended elevations for the work are as indicated.
B. Verify substrate has been inspected, gradients and elevations are correct, and is dry.

3.02 PREPARATION
A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.
B. Do not place aggregate on soft, muddy, or frozen surfaces.

3.03 INSTALLATION
A. Under Bituminous Concrete Paving:
   1. Place Aggregate Type Class B to a total compacted thickness of 9 or 6 inches as noted on Drawings.
   2. Compact to 95 percent of maximum dry density per ASTM D698.
B. Under Portland Cement Concrete Paving:
   1. Place Aggregate Type Class B to a total compacted thickness of 8 inches.
   2. Compact to 95 percent of maximum dry density per ASTM D698.
AGGREGATE BASE COURSES

C. Under Portland Cement Concrete Sidewalks
   1. Place Aggregate Type Class B to a total compacted thickness of 4 inches.
   2. Compact to 95 percent of maximum dry density per ASTM D698.
D. Place aggregate in maximum 8 inch layers and roller compact to specified density.
E. Level and contour surfaces to elevations and gradients indicated.
F. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.
G. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.04 TOLERANCES
   A. Flatness: Maximum variation of 1/4 inch measured with 10-foot straight edge.

3.05 FIELD QUALITY CONTROL
   A. See Section 01-4000 - Quality Requirements, for general requirements for field inspection and testing.
   B. Compaction density testing will be performed on compacted aggregate base course in accordance with ASTM D1556. Acceptance testing may be accomplished using a nuclear gauge in accordance with ASTM D6938.
   C. When using a nuclear gauge, the gauge must be field calibrated in accordance with ASTM Standards and the moisture content of the material determined per ASTM D6938.
   D. Results will be evaluated in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D698 ("standard Proctor") and ASTM D1557 ("modified Proctor") as specified above.
   E. If tests indicate work does not meet specified requirements, remove work, replace and retest.

3.06 CLEANING
   A. Remove unused stockpiled materials; leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

PART 4 - MEASUREMENT AND PAYMENT

4.01 UNDER BITUMINOUS CONCRETE AND PORTLAND CEMENT CONCRETE PAVING
   A. Measurement and payment for aggregate base will be made on a ton basis. A separate ticket shall accompany each load delivered to the job site and shall be given to the Engineer. No ticket will be accepted unless it shows the date, ticket number, driver's name, project name, quarry name, truck weight and gross weight and cubic yards of rock. A summary of tickets shall also be submitted.
   B. All rock trucks shall be weighed at least once each day while unloaded and weighed while loaded for each trip.
   C. Maximum compaction and loss allowance of 30% will be allowed between cubic yard in place volumes and trip tickets. Should material quantities exceed this allowance, the pay quantity will be made on the basis of the calculated in-place volume, plus the 30% allowance for waste and compaction.
   D. Measurement for ton in-place calculations will be incorporated in the work and accepted, wherein surface area is the design surface area or construction surface area of aggregate base, whichever is the lesser. Measurement shall be on the surface of the aggregate base to the nearest 0.1 foot and the square yardage shall be the nearest full square yard. Thickness of aggregate base will be the designed depth or construction depth, whichever is the lesser.
   E. Payment will be made for gravel surfacing replaced within limits as specified. No payment will be made for replacement of gravel surfacing (required due to damage or alteration by Contractor) not specifically necessary for construction on this Project.
4.02 UNDER PORTLAND CEMENT CONCRETE SIDEWALKS AND DRIVEWAYS

A. No separate measurement and payment will be made for aggregate base under Portland Cement sidewalks and driveways. Payment for aggregate base under Portland Cement concrete sidewalks and driveways shall be included as a portion of the per square foot unit price for Portland Cement concrete sidewalks and driveways.

B. It being understood, no separate measurement and payment for aggregate base under Portland Cement concrete sidewalks and driveways will be made.

END OF SECTION
SECTION 32-1216
ASPHALT PAVING

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Bituminous concrete paving.
   B. Surface sealer.

1.02 RELATED REQUIREMENTS
   A. Section 32-1123 - Aggregate Base Courses: Aggregate base course.

1.03 REFERENCE STANDARDS
   A. Use current adopted addition(s).

1.04 QUALITY ASSURANCE
   A. Perform Work in accordance with ODOT standard.
   B. Mixing Plant: Conform to ODOT standard.
   C. Obtain materials from same source throughout.
   D. Provide quality control per subsection 00745.16 of OSS. The intent of this project is for the Contractor to provide a certified ODOT mix design and compaction tests as provided in Section 00745.16. Other testing provided by Section 00745.16 may be required at the discretion of the Engineer.

1.05 FIELD CONDITIONS
   A. Do not place asphalt when ambient air or base surface temperature is less than 40 degrees F, or surface is wet or frozen.

PART 2 PRODUCTS
2.01 MATERIALS
   A. Asphalt Cement: PG64-22 performance grade asphalt cement conforming to ODOT requirements.
   B. HMAC shall be Level 2 HMAC, ½-inch Dense Graded Mix in accordance with OSS Section 00745.
   C. Tack Coat: Emulsified asphalt. Asphalt Tack Coat shall consist of CSS-1 or CSS-1h emulsified asphalt (EA) tack coat conforming to OSS 00730.
   D. Joint Sealant:
      1. Joint seal shall meet the test requirements of ASTM D 244.
      2. Joint seal material shall be CRS-1 or CRS-2 and shall meet the requirements of OSS; Section 02710 for Cationic Emulsified Rapid Setting Asphalt.

2.02 ASPHALT PAVING MIXES AND MIX DESIGN
   A. Submit proposed mix design of each class of mix for review prior to beginning of work.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify that compacted subgrade is dry and ready to support paving and imposed loads.
   B. Verify gradients and elevations of base are correct.
   C. Verify finish grade for manholes, catch basins, and other items within pavement area.
   D. Sequencing and Scheduling. Notify Engineer and appropriate state, county or city department at least 48 hours prior to placement of aggregate base and pavement to permit inspection.
   E. Adhere to all applicable ODOT, OSHA, county and city regulations pertaining to road closure, traffic control, and other related safety precautions.
3.02 BASE COURSE
A. Refer to Section 32-1123 - Aggregate Base Courses.
B. Ensure that aggregate base and other surfaces on which asphaltic concrete pavement is to be placed, are sound and compacted.

3.03 PREPARATION
A. To provide for the convenience and safety of the traveling public, pavement replacement shall be performed immediately following the completion of backfilling operations. In the event that pavement replacement cannot be performed as such, the Contractor shall maintain the trench backfill on a daily basis, as directed, until pavement replacement has been completed.
B. Pavement Sawcutting. Utility trenches in existing pavement areas shall be sawcut immediately prior to repaving. Sawcuts shall be made a minimum of 12 inches outside the limits of the trench, or to the outer extents of pavement damaged as a result of the Contractor’s operations, whichever is greater. See Trench Detail Drawing if applicable in Drawings. Depth of saw cut shall be sufficient to permit removal of material without damage to adjoining surfaces to remain.
C. Manholes, inlets, and other structures shall have been completed, adjusted, cured and otherwise prepared, as applicable, and made clean and ready for asphalt placement. Cover top surfaces with paper or other material to prevent adherence of asphalt or tack coat.

3.04 TACK COAT
A. Apply tack coat in accordance with manufacturer's instructions.
B. Ensure all surfaces are clean and dry. Remove all loose material.
C. Contact surfaces of manholes, inlets, gutters, curbs, existing pavement edges and other surfaces shall be treated with a layer of asphalt tack coat to provide a good bond and seal.
D. Coat surfaces of manhole and catch basin frames with oil to prevent bond with asphalt pavement. Do not tack coat these surfaces.
E. Contact surfaces of existing pavement shall be treated with a layer of tack coat asphalt. Material, equipment, and construction shall conform to the requirements of Section 00730 of OSS. The tack coat shall be cured thoroughly prior to the application of the asphaltic overlay. Do not place on wet surfaces or during cold weather.
F. Apply tack coat asphalt with a pressure distributor capable of uniformly applying the emulsified asphalt at even heat on variable surface widths up to 16-feet, at readily determined and controlled rates from 0.05 to 0.20 gallons per square yard, and with uniform pressure. Pressure distributor shall include a tachometer, pressure gages, accurate volume measuring devices and a thermometer for measuring temperature of tank contents. Pressure distributor shall be equipped with a positive power asphalt pump and full circulation spray bars adjustable both laterally and vertically. Set bar height for triple lap coverage.
G. Tack coat asphalt shall be at a temperature between 140º F and 185º F as recommended by the manufacturer at the time of application.
H. Do not place HMAC on the tack coat until the asphalt separates from the water, but before it loses its tackiness.
I. Application Rate (gallons / yd²)
   1. Surface: New HMAC; 0.05 to 0.07; 0.10 to 0.13 if diluted 1:1 with water
   2. Surface: Oxidized AC; 0.07 to 0.10; 0.13 to 0.20 if diluted 1:1 with water
   3. Surface: Milled AC; 0.10 to 0.13; 0.20+ if diluted 1:1 with water
J. Joints between existing and new asphaltic concrete shall be filled with crack sealant asphalt.

3.05 PLACING ASPHALT PAVEMENT
A. Unless otherwise specified herein, HMAC shall be mixed, processed, hauled, laid, compacted and finished in accordance with OSS Section 00745.
B. HMAC shall not be placed when the ambient temperature is below 40 degrees F unless otherwise approved by Engineer. When, in the judgment of the Engineer, the weather is such...
that satisfactory results cannot be achieved asphalt concrete paving operations shall be suspended.

C. Care shall be taken at all times to prevent segregation in the mixture.

D. HMAC at the time of placement shall have a temperature of at least 250 degrees F.

E. Place asphalt within 24 hours of applying primer or tack coat.

F. Deposit HMAC from haul vehicles so segregation is prevented. HMAC shall not be windrowed.

G. Placement

1. HMAC should be placed using a self-contained, self-propelled paver supported on tracks or wheels that do not contact the mix being placed.

2. When leveling irregular surfaces and raising low areas, do not exceed 2-inches actual compacted thickness on any one lift.

3. Place the mix in the number of lifts and courses, and to the compacted thickness for each lift and course as shown on the Plans. Limit the minimum lift thickness to twice the maximum aggregate size in the mix.

H. Pavement shall be placed, shaped, compacted and finished to the grades and cross sections shown on the Plans or established. Taper new overlays at limits to match existing asphalt pavement.

I. HMAC shall be compacted using self-propelled steel wheeled static rollers, vibratory rollers, or pneumatic tired rollers capable of achieving the minimum compaction specified. If vibratory rollers are used, they should be specifically designed for compaction of HMAC, have adjustable amplitude and frequency, and be capable of at least 2000 vibrations per minute. Finish rolling should be performed by a static roller or a vibratory roller in the static mode.

J. Place to 2-inch compacted thickness minimum or as shown in the Drawings. Asphalt concrete pavement in excess of 2-inches thick shall be constructed in multiple lifts of approximately equal thickness. The maximum compacted thickness of any individual lift shall not exceed 2-inches.

K. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.

L. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

M. Asphalt concrete pavement shall be compacted to a minimum of 92% relative compaction with the theoretical maximum density determined by AASHTO T-209. Testing shall be performed at random locations using a nuclear gauge operated in the back-scatter mode. At least one density test shall be performed every 1000 lineal feet on each spread or a minimum of one test each day of production.

N. Test the top surfaces with a 12-foot long straight edge in conformance with Section 00745.70 of OSS. The finish grade shall have a smooth uniform surface for storm drainage with no low spots that would collect water, causing puddling.

O. Surface of the asphalt concrete after compaction shall be smooth and true to a tolerance of 0.02 foot of the established cross section and grade, conforming to Section 00745.70 of OSS. Any mixture that become loose or broken, mixed with dirt, or is in any way defective, shall be removed and replaced with fresh hot mixture which, when compacted, shall conform to the surrounding area. There shall be no sign of roller marks. All costs in correcting defective surfaces shall be borne by the Contractor.

3.06 TOLERANCES

A. Flatness: Maximum variation of 1/4 inch measured with 10-foot straight edge.

B. Variation from True Elevation: Within 1/2 inch.

3.07 FIELD QUALITY CONTROL

A. See Section 01-4000 - Quality Requirements, for general requirements for quality control.
3.08 PROTECTION
A. Immediately after placement, protect pavement from mechanical injury for 7 days or until surface temperature is less than 140 degrees F.
B. No traffic shall come in contact with any newly paved surface until surface has cooled and set sufficiently to prevent marking. The Contractor is responsible for this traffic control.
C. After completion of paving, the Contractor shall remove from the site all debris resulting from the Contractor’s operation.
D. All costs incurred in the repair of deficiencies or damages shall be borne by the Contractor, and no additional compensation shall be due the Contractor.

PART 4 MEASUREMENT AND PAYMENT
A. Payment for asphaltic concrete used in the accepted work as specified will be made on a ton (2,000 lbs) basis, as weighed on approved and certified scales furnished by the Contractor. Payment for asphaltic concrete shall be full compensation for all work necessary to prepare and place the asphaltic concrete pavement. There will be no separate measurement or payment of bituminous cements or additives contained in the mixture or used otherwise in the work.
B. A separate ticket shall accompany each load delivered to the job site and shall be given to the Engineer. No ticket will be accepted unless it shows the date, ticket number, driver’s name, project name, truck weight and gross weight and tonnage of asphalt.
C. All trucks shall be weighed at least once a day while unloaded and weighed while loaded for each trip.

END OF SECTION
SECTION 32-1313
CONCRETE PAVING

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Concrete, sidewalks, integral curbs, gutters, and other slabs.

1.02 RELATED REQUIREMENTS
A. Section 31-2200 - Grading: Preparation of site for paving and base and preparation of subsoil at pavement perimeter for planting.
B. Section 31-2323 - Fill: Compacted subbase for paving.
C. Section 32-11-23 - Aggregate Base Courses: Rock base courses.

1.03 REFERENCE STANDARDS
A. Use current adopted addition(s).

1.04 SUBMITTALS
A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on joint filler, admixtures, and curing compound.
C. Mix design submittals and certificates of compliance shall be furnished at least 30 days prior to any anticipated concrete placement. All submittals must be approved by the Engineer prior to placement of any concrete.
D. Contractor is responsible to obtain design of the concrete mix that shall conform to ASTM C94 and the requirements of this section. Mix design shall be prepared by a professional testing laboratory or concrete mix design professional.
E. Submit properties of each mix design for each class of concrete including:
   1. Average compressive strength of proposed mixture
   2. Documentation of strength test results of similar concrete mixtures in accordance with ACI 318
   3. Slump
   4. Air Content
   5. Density
   6. Water/Cement ratio
   7. Maximum aggregate size
   8. Cementitious materials and type
   9. Admixtures
F. Certificates of compliance for aggregate, cement, and admixtures signed by the concrete supplier certifying that materials meet or exceed these specifications.
G. Concrete placement schedule showing construction joint locations and type, and placement sequence.
H. Product data for proposed curing compounds, admixtures, hardeners, sealers, etc. to be used.

1.05 QUALITY ASSURANCE
A. Perform work in accordance with ACI 301.
B. Conform to ACI 305R in hot weather.
C. Conform to ACI 306R in cold weather.
D. Installer Qualifications: Concrete work shall be finished by persons with at least 5 years experience with work of similar scope and quality.
E. No chloride containing admixtures shall be used.
F. On-Site water addition to concrete (retempuring) will not be permitted.
G. Conduct field-testing as specified.
H. Admixtures shall be added in strict conformance with the manufacturer’s instructions.
I. Manufacturer Qualifications: Concrete supplied from concrete plants with current certification under the NRMCA Certification of Ready Mixed Concrete Production Facilities. Individual with responsibility for concrete mixtures certified as an NRMCA Concrete Technologist Level 2.

PART 2 PRODUCTS

2.01 FORM MATERIALS
A. Form Materials: As specified in Section 03-1000, conform to ACI 301.
B. Joint Filler: Preformed; non-extruding bituminous type (ASTM D1751) or sponge rubber or cork (ASTM D1752).
   1. Thickness: 1/2 inch.

2.02 CONCRETE MATERIALS
A. Obtain cementitious materials from same source throughout.
C. Coarse Aggregate, ASTM C33:
   1. Use coarse aggregate from only one source for exposed concrete in a single structure.
   2. Coarse aggregate shall be smooth, rounded and uniform. No more than 15% shall be elongated (max. dimension 5 times min. dimension).
   3. Coarse aggregate shall be durable, sound and hard.
   4. Maximum Size: 3/4-inch, but not more than one-fifth of narrow dimension between sides of Formwork, one-fourth depth of slab, nor three fourths of narrowest distance between Reinforcing Steel.
D. Fine Aggregate, ASTM C33:
   1. Use fine aggregate from only one source for exposed concrete in a single structure.
   2. Fine aggregate shall not exceed 40% by weight of combined aggregate total, except when coarse aggregate maximum size is ½-inch or less.
   3. Fine aggregate shall be durable, sound, clean and hard.
   4. Sand Equivalent of 75 minimum per ASTM D2419.
E. Fly Ash: ASTM C618, Class C or F.
F. Calcined Pozzolan: ASTM C618, Class N.
G. Silica Fume: ACI 211.1.
H. Water: Clean, and not detrimental to concrete.
I. Air-Entraining Admixtures: ASTM C260/C260M.
   1. Manufacturers:
      a. BASF
   2. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

2.03 ACCESSORIES
A. Curing Compound: ASTM C309, Type 1, Class A.

2.04 CONCRETE MIX DESIGNS
A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.

C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer. Air entraining and water reducing admixtures are required.

D. **Standard Concrete** (sidewalks, curbs, gutters)
   1. Compressive strength, when tested in accordance with ASTM C39/C39M at 28 days; 3000 psi.
   2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
   3. Calcined Pozzolan Content: Maximum 10 percent of cementitious materials by weight.
   4. Silica Fume Content: Maximum 5 percent of cementitious materials by weight.
   5. Water-Cement Ratio: Maximum 40 percent by weight.
   6. Total Air Content: 5 percent, determined in accordance with ASTM C173/C173M.

E. **Vehicular Sidewalk Crossings**
   1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 5,000 psi.
   2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
   3. Calcined Pozzolan Content: Maximum 10 percent of cementitious materials by weight.
   4. Silica Fume Content: Maximum 5 percent of cementitious materials by weight.
   5. Water-Cement Ratio: Maximum 40 percent by weight.
   6. Total Air Content: 5 percent, determine in accordance with ASTM C173/C173M.

### 2.05 MIXING

A. Transit Mixers: Comply with ASTM C94/C94M.

### 2.06 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M Grade 60 - 60,000 psi.
   1. Deformed billet-steel bars.
   2. Unfinished.

B. Reinforcement Accessories:
   1. Tie Wire: Annealed, minimum 16 gage.
   2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete pavement.

C. Fabrication:
   1. Fabricate concrete reinforcing in accordance with CRSI (DA4) - Manual of Standard Practice.
   2. Welding of reinforcement is not permitted.
   3. Locate reinforcing splices not indicated on drawings at point of minimus stress.

### PART 3 EXECUTION

#### 3.01 EXAMINATION

A. Verify compacted subgrade is acceptable and ready to support paving and imposed loads.

B. Verify gradients and elevations of base are correct.

#### 3.02 SUBBASE

A. See Section 32-1123 for construction of base course for work of this Section.

#### 3.03 PREPARATION

A. Moisten base to minimize absorption of water from fresh concrete.

B. Coat surfaces of manhole frames with oil to prevent bond with concrete pavement.
C. Notify Architect minimum 24 hours prior to commencement of concreting operations.

3.04 FORMING
A. Place and secure forms to correct location, dimension, profile, and gradient.
B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.05 PLACING CONCRETE
A. Place concrete in accordance with ACI 304R.
B. Ensure reinforcement, inserts, embedded parts, formed joints are not disturbed during concrete placement.
C. Place concrete continuously over the full width of the panel and between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.

3.06 JOINTS
A. Place 3/8 inch wide expansion joints at 20 foot intervals and to separate paving from vertical surfaces and other components and in pattern indicated.
B. Provide scored joints.
   1. At 6 feet intervals, unless shown otherwise.
   2. Between sidewalks and curbs.

3.07 FINISHING
A. Sidewalk Paving: Light broom, texture perpendicular to direction of travel with troweled and radiused edge 1/4 inch radius.
B. Curbs and Gutters: Light broom, texture parallel to pavement direction.
C. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer’s instructions.

3.08 TOLERANCES
A. Maximum Variation of Surface Flatness: 1/4 inch in 10 ft.
B. Maximum Variation From True Position: 1/4 inch.

3.09 REINFORCEMENT PLACEMENT
A. Place, support and secure reinforcement against displacement. Do not deviate from required position.
B. Do not displace or damage vapor barrier.
C. Accommodate placement of formed openings.
D. Maintain concrete cover around reinforcing as follows:
   1. Supported Slabs and Joists: 3/4 inch, not exposed to ground or weather.
   2. Walls (exposed to weather or backfill): 2 inch.
   3. Footings and Concrete Formed Against Earth: 2 inch.
   4. Slabs on Fill: 3 inch.
E. Conform to applicable code for concrete cover over reinforcement.

3.10 FIELD QUALITY CONTROL
A. An independent testing agency will perform field quality control tests, as specified in Section 01-4000 - Quality Requirements.
   1. Provide free access to concrete operations at project site and cooperate with appointed firm.
B. Compressive Strength Tests: ASTM C39/C39M; for each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cu yd or less of each class of concrete placed.

3.11 PROTECTION
A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.

PART 4 PAYMENT
4.01 MEASUREMENT AND PAYMENT
A. Cost for Concrete Paving and other work in this section shall be square foot for sidewalks and lineal feet for curbs. Refer to Bid Form.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Furnishing and installing traffic markings for street striping, arrows, crosswalks, islands, parking stalls and stop bars. The traffic markings shall be placed as designated by the Engineer.

1.02 RELATED SECTIONS
   A. Section 32-1216 - Asphalt Paving.

1.03 The Contractor is responsible for protection of these facilities until such time as they are ready for use by the general public.

1.04 Traffic markings shall be provided where existing markings are disturbed, damaged or removed during construction by any portion of the project.

1.05 The intent of this Section is to specify the restoration of markings to match the existing layout.

1.06 REFERENCES
   A. Use current adopted addition(s).

PART 2 MATERIALS

2.01 MATERIALS
   A. Crosswalks, Stop Bars and Arrows.
      1. Thermoplastic
         a. Color - white
         b. Thermoplastic pavement markings shall be Type B (Prefabricated retro reflective film) as specified in Section 00850 of the OSS.
   B. Centerline Traffic Lane Striping Paint.
      1. Comply with Section 00861 of the OSS.
      2. Color - white or yellow to match existing striping.
      3. Paint shall be made specifically for application upon asphaltic concrete surfaces.
      4. Paint shall be reflectorized type.

PART 3 EXECUTION

3.01 The pavement surface shall be free of dirt, grease, moisture or any other foreign materials prior to placement of striping and pavement markers. Air blast the pavement with an acceptable high-pressure system to remove extraneous or loose material.

3.02 Apply in accordance with manufacturer's recommendations. The ambient temperature shall be at least 10 degrees C and rising.

3.03 THERMOPLASTIC
   A. Crosswalks and stop bars shall be in accordance with ODOT/APWA Standard Detail Drawings TM503 and 501 respectively. Arrows shall be in accordance with ODOT/APWA Standard Detail Drawing TM501 and placed at same location of the existing directional arrows.
   B. After the pavement surface is clean and dry, apply a primer to the area receiving the thermoplastic pavement markings in a continuous, solid film according to the recommendations of the primer manufacturer and the thermoplastic manufacturer.
   C. Apply in accordance with Section 00850 of the OSS.

3.04 PAINT
   A. Centerline and traffic lane strips shall be 4" wide. Color shall be yellow.
   B. Parking lane stripes shall be 4 inches wide.
   C. Limit of striping shall comply with the area disturbed by construction.
   D. Bike lanes stencils shall be in accordance with ODOT/APWA Standard Detail TM503.
E. Disabled parking symbol. Color shall be white.
F. Provide cross-hatching stripes to identify non-parking areas.
G. Apply in accordance with Section 02840 of OSS.

PART 4 PAYMENT
A. Payment for Pavement Specialties will be made on a Lump Sum basis as stated in the Bid Form.

END OF SECTION
SECTION 32-1713
PARKING BUMPERS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Parking bumpers.
B. Adhesive.
C. Steel bars for installation.

1.02 REFERENCE STANDARDS
   1. Epoxy - Section 02070.

1.03 SUBMITTALS
A. General: Refer to Section 01-3000 - Administrative Requirements: Submittals, Shop Drawings, Product Data, and Samples, for submittal requirements and procedures.
B. Shop Drawings: Submit Shop Drawings for bumpers, including plan layout and installation details, for approval.
C. Product Data: Submit manufacturers’ product data of precast bumpers and epoxy adhesive for approval.

1.04 QUALITY ASSURANCE
A. Precast parking bumpers shall be manufactured for the intended purpose by a company or firm specializing in the manufacture of precast concrete parking appurtenances.

PART 2 PRODUCTS

2.01 MATERIALS
A. Parking Bumpers:
   1. Provide precast concrete parking bumpers of half octagonal configuration and dimensions. Unless indicated otherwise, provide bumpers of 72"-inch length.
   2. Bumpers shall be manufactured of Class 4000 reinforced concrete - Portland Cement Concrete, to withstand constant use and rough service. Each bumper shall be reinforced with two No. 4 deformed steel reinforcing bars, minimum.
   3. Each bumper to be installed on at-grade asphalt pavement shall be manufactured with two holes to accommodate the installation rebar. Holes shall be positioned 6 inches in from each end.
B. Adhesive: Adhesive for anchoring bumpers or wheel stops to pavement shall be an epoxy adhesive manufactured for the purpose, from ODOT/APWA QPL.
C. Steel Bars for Installation: Rebar, No. 5 size, conforming to ASTM A615, Grade 60.
D. Adhesive: Epoxy type.

PART 3 EXECUTION

3.01 INSTALLATION
A. Precast concrete bumpers shall be anchored and secured in position on at-grade asphalt pavements, as indicated, with two No. 5 epoxy-coated rebar and an epoxy adhesive as specified in Article 2.01.B herein.
PART 4 – PAYMENT

4.01 MEASUREMENT AND PAYMENT

A. No separate measurement and/or payment will be made for any/all work and items specified or required by this Section. All requirements of this Section are considered incidental to the project and shall be fulfilled by Contractor(s) working on the project, with no additional cost to the Owner.

END OF SECTION
SECTION 32-1723
PAVEMENT MARKINGS

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Parking lot markings, including parking bays, crosswalks, arrows, handicapped symbols, and curb markings.
   B. Accessibility Signage.
   C. Roadway lane markings and crosswalk markings.

1.02 RELATED REQUIREMENTS
   A. Section 32-1216 - Asphalt Paving.
   B. Section 32-1313 - Concrete Paving.

1.03 REFERENCE STANDARDS
   A. Use current adopted addition(s).

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

1.05 DELIVERY, STORAGE, AND HANDLING
   A. Deliver paint in containers of at least 5 gallons accompanied by batch certificate.
   B. Store products in manufacturer's unopened packaging until ready for installation.
   C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.06 FIELD CONDITIONS
   A. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS
2.01 MATERIALS
   A. Line and Zone Marking Paint: MPI (APL) No. 97 Latex Traffic Marking Paint; color(s) as indicated.
      1. Roadway Markings: As required by authorities having jurisdiction.
   B. Crosswalks, Stop Bars and Arrows.
      1. Thermoplastic
         a. Color - white.
         b. Thermoplastic pavement markings shall be Type B (prefabricated retro reflective film) as specified in Section 00850 of the OSS.
   C. Signage: See Drawings.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Do not begin installation until substrates have been properly prepared.
   B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
3.02 PREPARATION

A. Allow new pavement surfaces to cure for a period of not less than 14 days before application of marking materials.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
C. Clean surfaces thoroughly prior to installation.
   1. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water, or a combination of these methods.
D. Where oil or grease are present, scrub affected areas with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinse thoroughly after each application; after cleaning, seal oil-soaked areas with cut shellac to prevent bleeding through the new paint.

3.03 INSTALLATION

A. Begin pavement marking as soon as practicable after surface has been cleaned and dried.
B. Do not apply paint if temperature of surface to be painted or the atmosphere is less than 50 degrees F or more than 95 degrees F.
C. Apply in accordance with manufacturer's instructions using an experienced technician that is thoroughly familiar with equipment, materials, and marking layouts.
D. Apply uniformly painted markings of color(s), lengths, and widths as indicated on drawings true, sharp edges and ends.
   1. Apply paint in one coat only.
   2. Wet Film Thickness: 0.015 inch, minimum.
   3. Width Tolerance: Plus or minus 1/8 inch.
E. Roadway Traffic Lanes: Use suitable mobile mechanical equipment that provides constant agitation of paint and travels at controlled speeds.
   1. Conduct operations in such a manner that necessary traffic can move without hindrance.
   2. Place warning signs at the beginning of the wet line, and at points well in advance of the marking equipment for alerting approaching traffic from both directions. Place small flags or other similarly effective small objects near freshly applied markings at frequent intervals to reduce crossing by traffic.
   3. If paint does not dry within expected time, discontinue paint operations until cause of slow drying is determined and corrected.
   4. Skip Markings: Synchronize one or more paint "guns" to automatically begin and cut off paint flow; make length of intervals as indicated.
   5. Use hand application by pneumatic spray for application of paint in areas where a mobile paint applicator cannot be used.
F. Parking Lots: Apply parking space lines, entrance and exit arrows, painted curbs, and other markings indicated on drawings.
   1. Mark the International Handicapped Symbol at indicated parking spaces.
   2. Hand application by pneumatic spray is acceptable.
G. Symbols: Use a suitable template that will provide a pavement marking with true, sharp edges and ends, of the design and size indicated.
H. Thermoplastic:
   1. Crosswalks and stop bars shall be in accordance with ODOT/APWA Standard Detail Drawings TM503 and 501 respectively. Arrows shall be in accordance with ODOT/APWA Standard Detail Drawing TM501 and placed at same location of the existing directional arrows.
   2. After the pavement surface is clean and dry, apply a primer to the area receiving the thermoplastic pavement markings in a continuous, solid film according to the recommendations of the primer manufacturer and the thermoplastic manufacturer.
3. Apply in accordance with Section 00850 of the OSS.

3.04 DRYING, PROTECTION, AND REPLACEMENT

A. Protect newly painted markings so that paint is not picked up by tires, smeared, or tracked.
B. Provide barricades, warning signs, and flags as necessary to prevent traffic crossing newly painted markings.
C. Allow paint to dry at least the minimum time specified by the applicable paint standard and not less than that recommended by the manufacturer.
D. Remove and replace markings that are applied at less than minimum material rates; deviate from true alignment; exceed length and width tolerances; or show light spots, smears, or other deficiencies or irregularities.
E. Remove markings in manner to avoid damage to the surface to which the marking was applied, using carefully controlled sand blasting, approved grinding equipment, or other approved method.
F. Replace removed markings at no additional cost to Owner.

PART 4 PAYMENT

4.01 MEASUREMENT AND PAYMENT

A. Payment for Pavement Markings will be made on a Lump Sum basis as stated in the Bid Form.

END OF SECTION
SECTION 32-1726
TACTILE WARNING SURFACE

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Plastic tactile and detectable warning tiles for pedestrian walking surfaces.

1.02 RELATED REQUIREMENTS
   A. Section 32-1313 - Concrete Paving: Concrete sidewalks.

1.03 REFERENCE STANDARDS
   A. Use current adopted addition(s).

1.04 SUBMITTALS
   A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Submit manufacturer's product data, standard details, details specific to this project; written installation and maintenance instructions.
   C. Warranty: Submit manufacturer warranty; complete forms in Owner's name and register with manufacturer.

1.05 WARRANTY
   A. See Section 01-7800 - Closeout Submittals, for additional warranty requirements.
   B. Plastic Tiles: Provide manufacturer's standard five year warranty against manufacturing defects, breakage or deformation.

PART 2 PRODUCTS
2.01 TACTILE AND DETECTABLE WARNING DEVICES
   A. Plastic Tactile and Detectable Warning Tiles: ADA Standards compliant, glass fiber and carbon fiber reinforced, exterior grade, matte finish polyester sheet with truncated dome pattern, solid color throughout, internal reinforcing of sheet and of truncated domes, integral radius cut lines on back face of tile; with factory applied removable protective sheeting.
   1. Material Properties:
      a. Water Absorption: 0.20 percent, maximum, when tested in accordance with ASTM D570.
      b. Slip Resistance: 0.50 minimum dry static coefficient of friction, when tested in accordance with ASTM D2047.
      c. Compressive Strength: 25,000 pounds per square inch, minimum, when tested in accordance with ASTM D695.
      d. Tensile Strength: 10,000 pounds per square inch, minimum, when tested in accordance with ASTM D638.
      e. Flexural Strength: 25,000 pounds per square inch minimum, when tested in accordance with ASTM D790.
      f. Chemical Stain Resistance: No reaction to 1 percent hydrochloric acid, motor oil, calcium chloride, gum, soap solution, bleach, or antifreeze, when tested in accordance with ASTM D543.
      g. Abrasion Resistance: 300, minimum, when tested in accordance with ASTM C501.
      h. Flame Spread Index: 25, maximum, when tested in accordance with ASTM E84.
      i. Accelerated Weathering: Delta-E of less than 5.0 at 2,000 hours exposure, when tested in accordance with ASTM G155.
      j. Adhesion: No delamination of tile prior to board failure in a temperature range of 20 to 180 degrees F, when tested in accordance with ASTM C903.
      k. Loading: No damage when tested according to AASHTO LRFD test method HS20.
      l. Salt and Spray Performance: No deterioration or other defect after 200 hours of exposure, when tested in accordance with ASTM B117.
2. Installation Method: Surface applied.
3. Shape: As shown on Drawings.
4. Dimensions: 24 inches by 48 inches or length as shown on Drawings.
5. Pattern: In-line pattern of truncated domes complying with ADA Standards.
7. Products:
   a. ADA Solutions, Inc; Surface Applied System: www.adatile.com/#sle.
   b. ADA Solutions, Inc; Surface Applied Tactile Warning Tile for Transit Use: www.adatile.com
   d. Substitutions: See Section 01-6000 - Product Requirements.

2.02 ACCESSORIES
   A. Fasteners: ASTM A666, Type 304 stainless steel
      1. Type: Countersunk, color matched composite sleeve anchors.
      2. Size: 1/4 inch diameter and 1-1/2 inches long.
   B. Adhesive: Type recommended and approved by surfacing tile manufacturer.
   C. Sealant: Urethane elastomeric or polyether structural sealant of color to match adjacent surfaces; approved by surfacing tile manufacturer.

PART 3 EXECUTION
3.01 EXAMINATION
   A. When installation location is near site boundary or property line, verify required location using property survey.
   B. Verify that work area is ready to receive work:
      1. If existing conditions are not as required to properly complete the work of this section, notify Architect.
      2. Do not proceed with installation until deficiencies in existing conditions have been corrected.
   C. Verify that dimensions, tolerances, and attachment methods for work in this section are properly coordinated with other work on site.

3.02 INSTALLATION, GENERAL
   A. Install in accordance with manufacturer's written instructions.
      1. Do not install damaged, warped, bowed, dented, abraded, or otherwise defective units.
      2. Do not install when ambient or substrate temperature has been below 40 degrees F during the preceding 8 daylight hours.
   B. Field Adjustment:
      1. Locate relative to curb line in compliance with ATBCB PROWAG, Sections 304 and 305.
      2. Orient so dome pattern is aligned with the direction of ramp.
   C. Install units fully seated to substrate, square to straight edges and flat to required slope.

3.03 INSTALLATION, SURFACE APPLIED PLASTIC TILES
   A. Cure concrete surfaces for a minimum of 4 days before installing units.
   B. Mechanically roughen surface as required to remove contaminants and prepare surface for adhesive and sealant application.
   C. Drill fastener holes straight, true and to depth recommended by manufacturer.
   D. Apply adhesive to back of unit as recommended by manufacturer.
   E. Mechanically fasten to substrate. Avoid striking or damaging the unit itself during installation.
   F. Apply sealant to edges in cove profile.
3.04 CLEANING PLASTIC UNITS
   A. Remove protective plastic sheeting within 24 hours of installation.
   B. Remove excess sealant or adhesive from joints and edges.
   C. Clean four (4) days prior to date of scheduled inspection.

3.05 PROTECTION
   A. Protect installed units from traffic, subsequent construction operations or other imposed loads until concrete is fully cured.
   B. Touch-up, repair or replace damaged products prior to Date of Substantial Completion.

PART 4 – PAYMENT

4.01 MEASUREMENT AND PAYMENT
   A. The lump sum payment, as listed on the Bid Form, shall be full compensation for preparing the site for installation of the Tactile Warning Surface and furnishing and installing all components for complete operational system.

END OF SECTION
PART 1  GENERAL

1.01  SECTION INCLUDES
A. Pipe and fittings, valves, sprinkler heads, emitters, bubblers, and accessories.
B. Control system.

1.02  REFERENCE STANDARDS

1.03  ADMINISTRATIVE REQUIREMENTS
A. Coordination: Coordinate the work with site backfilling, landscape / final grading, paving, and delivery of plant life.
B. Preinstallation Meeting: Convene one week prior to commencing work of this Section

1.04  SUBMITTALS
A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate piping layout to water source, location of sleeves under pavement, location and coverage of sprinkler heads, components, plant and landscaping features, site structures, schedule of fittings to be used.
C. Product Data: Provide component and control system and wiring diagrams.
D. Operation and Maintenance Data:
   1. Provide instructions for operation and maintenance of system and controls, seasonal activation and shutdown, and manufacturer's parts catalog.
   2. Provide schedule indicating length of time each valve is required to be open to provide a determined amount of water.

1.05  QUALITY ASSURANCE
A. Installer Qualifications: Company specializing in performing the work of this section with minimum 3 years of experience and valid license by the state.

PART 2  PRODUCTS

2.01  IRRIGATION SYSTEM
A. Electric solenoid controlled underground irrigation system, with low point self drain.
   1. All components shall be from same manufacturer as applicable.
   2. Refer to Drawings.
B. Manufacturers:
   4. Substitutions: See Section 01-6000 - Product Requirements.

2.02  PIPE MATERIALS
A. PVC Pipe: ASTM D2241; 200 psi pressure rated upstream from controls, 160 psi downstream; solvent welded sockets.
B. Fittings: Type and style of connection to match pipe.
C. Solvent Cement: ASTM D2564 for PVC pipe and fittings.
D. Polyethylene Pipe and Fittings: Manufactured from virgin polyethylene in accordance with ASTM D 2239.
   1. Fittings: Manufactured in accordance with ASTM D 2609, PVC type I.
E. Sleeve Material: PVC.

2.03 OUTLETS
A. Outlets: Brass construction.
B. Spray Type Sprinkler Head: Pop-Up head with stainless steel retract spring.
C. Bubbler: Adjustable outlet and 2 plastic inlet filter screens to prevent clogging. The bubbler shall have a 1/2 inch female thread inlet for connecting to the piping system riser.
D. Nozzles:
   1. All sprinklers shall have a matched precipitation rate (MPR) plastic or brass nozzle with adjusting screw capable of regulating the radius and flow.
   2. The nozzle shall be constructed of UV-resistant plastic. The radius adjustment screen shall be constructed of stainless steel.
   3. Nozzles shall have precipitation rates metered across sets and across patterns.
   4. The nozzle shall accept a non-clogging filter screen to allow for radius adjustment and also shall accept a pressure compensating screen.
E. Quick Coupler: Two-piece type, same size as line size. The valve body shall be constructed of red brass. The cover shall be a durable, self-closing rubber cover. The valve shall be opened and closed by a brass key of the same manufacturer. The valve throat shall have a key-way with detent positions for regulating water flow.

2.04 VALVES
A. Valves: Hydraulic; normally open; hydraulic tubing, including required fittings and accessories.
B. Backflow Preventer: Backflow prevention shall meet current Oregon and local jurisdiction code requirements. See Section 33-1200 Water Utility Distribution Equipment.
C. Gate Valves: Bronze construction non-rising stem.
D. Ball Valves: NSF-61 certified, PVC construction, PTFE seat with double O-ring stem. Asahi 21 Ball Valve x 2” True Union SOC/THRD PVC Viton.
   1. Max. psi rating: 230 psi
E. Accessories: Locking Valve Box and Cover.

2.05 CONTROLS
A. Controller: Provide Rainbird ESP-SMT Controller or as specified on Drawings. Coordinate location with Owner and Project Coordinator. Notify Project Coordinator if additional expansion modules are needed.
B. Wire Conductors: Color coded.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify location of existing utilities.
B. Verify that required utilities are available, in proper location, and ready for use.

3.02 PREPARATION
A. Piping layout indicated is diagrammatic only. Route piping to avoid plants, ground cover, and structures.
B. Layout and stake locations of system components.
C. Review layout requirements with other affected work. Coordinate locations of sleeves under paving to accommodate system.
3.03 TRENCHING
A. Trench and backfill in accordance with Section 31-2316.13 - Trenching and Section 31-2323 – Fill.
B. Trench to accommodate grade changes and slope to drains.
C. Maintain trenches free of debris, material, or obstructions that may damage pipe.

3.04 INSTALLATION
A. Install pipe, valves, controls, and outlets in accordance with manufacturer's instructions.
B. Connect to utilities.
C. Set outlets and box covers at finish grade elevations.
D. Provide for thermal movement of components in system.
E. Use threaded nipples for risers to each outlet.
F. After piping is installed, but before outlets are installed and backfilling commences, open valves and flush system with full head of water.

3.05 FIELD QUALITY CONTROL
A. Prior to backfilling, test system for leakage at main piping to maintain 100 psi pressure for one hour.
B. System is acceptable if no leakage or loss of pressure occurs and system self drains during test period.

3.06 BACKFILLING
A. Provide 3-inch sand cover over piping.
B. Backfill trench and compact to specified subgrade elevation. Protect piping from displacement.

3.07 SYSTEM STARTUP
A. Prepare and start system in accordance with manufacturer's instructions.
B. Adjust control system to achieve time cycles required.
C. Adjust head types for full water coverage as directed.

3.08 CLOSEOUT ACTIVITIES
A. Instruct Owner's personnel in operation and maintenance of system, including adjusting of sprinkler heads, adjustment to control system and seasonal (spring) startup and (fall) shutdown procedures.
B. Use operation and maintenance data as basis for demonstration.

3.09 MAINTENANCE
A. See Section 01-7000 - Execution and Closeout Requirements for additional requirements relating to maintenance service.

PART 4 - PAYMENT
A. The lump sum payment, as listed on the Bid Form, shall be full compensation for preparing the site for installation of the Landscape Irrigation System and furnishing and installing all components for complete operational system.

END OF SECTION
SECTION 32-9200

SEEDING

PART 1  GENERAL

1.01  SECTION INCLUDES

A. Preparation of subsoil.
B. Placing topsoil.
C. Hydrosedding, mulching and fertilizer for seeded areas only.

1.02  RELATED REQUIREMENTS

A. Section 31-2200 - Grading: Preparation of subsoil and placement of topsoil in preparation for the work of this section.

1.03  DELIVERY, STORAGE, AND HANDLING

A. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable. Deliver seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.
B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

PART 2  PRODUCTS

2.01  SEED MIXTURE

   1. 25 lbs. per 1,000 sq.ft. seeding rate:
      a. Metolius Perennial Ryegrass: 33%
      b. Palmer 3 Perennial Ryegrass: 33%
      c. Pennant 3 / Prelude 3 Perennial Ryegrass: 33%

B. Slope Stabilization Mix: Native Salt Tolerant Erosion Control mix, by Sunmark Seeds International, Fairview, Oregon, or approved equal.
   1. 5 lbs. per 1,000 sq. ft. seeding rate:
      a. Meadow Barley 50 percent/wt.
      b. California Brome 30 percent
      c. Roemer’s Fescue 8 percent
      d. Strawberry Clover 5.5 percent
      e. Farewell to Spring 2 percent
      f. Hooker’s Evening Primrose 2 percent
      g. Tufted Hairgrass 1.5 percent
      h. Spice Bentograss 1 percent

C. Biofiltration Seed Mix: Coastal Grasslands Mix by Sunmark Seeds International, Fairview, Oregon, or approved equal.
   1. 5 lbs. per 1,000 sq. ft. seeding rate, 65.42 PLS lbs. per acre:
      a. Meadow Barley 40 percent/wt.
      b. California Brome 25 percent
      c. Sicklekeel Lupine 20 percent
      d. Small Camas 4 percent
      e. Roemer's Fescue 3.9 percent
      f. Slough Sedge 3.5 percent
      g. Tufted Hairgrass 2 percent
      h. Poverty Rush 0.10 percent
      i. Spike Bentgrass 0.50 percent
2.02 SOIL MATERIALS
A. Fill Type Class F: As specified in Section 32-2323 - Fill.
B. Biotic Soil Amendment, Amended Soil for Planting Areas:
   1. PermaMatrix Biotic Soil Amendment HYDRO.
      a. Composition: Organics, Microbes, Mycorrhizae, Burlap/Straw Fiber, Plant Growth Aids:
         (1) Organic Humic Compounds: 6.4 - 6.6 pH.
         (2) Blended Fiber: NA pH.
         (3) Charcoal (Biochar): 8.0 - 9.0 pH.
         (4) EcoLive Mycorrhizae: 6.0 - 7.0 pH.
         (5) Ecobiotics Microbial Suite: 6.5 - 6.7 pH.
         (6) Water Storing Organic Polymer: 6.0 - 7.0 pH.
   2. Or approved equal. Substitutions: See Section 01-6000 - Product Requirements.

2.03 ACCESSORIES
A. Mulching Material: Oat or wheat straw, free from weeds, foreign matter detrimental to plant life, and dry. Hay or chopped cornstalks are not acceptable.
B. Fertilizer for Lawn Areas Only: Slow release; recommended for grass, with fifty percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil, to the following proportions, or as recommended by Seed Mixture manufacturer:
   1. Nitrogen: 14 percent.
   2. Phosphoric Acid: 18 percent.
   3. Soluble Potash: 12 percent.
C. Edging:
   1. 100% Recycled Plastic Composite board, by Bender Board Landscape Products, or equal.
      a. Size: 2x4 typical, 4-foot diameter commercial Tree ring (Alt. Bid)
      b. Color: Redwood Brown
      c. Supply stakes and accessories per manufacturer’s installation requirements
      d. Locations:
         1) To separate grass areas from mulch / rock.
         2) At all tree locations. See Drawings (Alternate Bid).
         3) See Drawings for additional locations.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that prepared soil base is ready to receive the work of this Section.

3.02 PREPARATION
A. Prepare subgrade in accordance with Section 31-2200.
B. Place topsoil in accordance with Section 31-2200.
C. Install edging at locations shown on Drawings.

3.03 FERTILIZING
A. Apply fertilizer in accordance with manufacturer's instructions.
B. Apply after smooth raking of topsoil and prior to roller compaction.
C. Do not apply fertilizer at same time or with same machine as will be used to apply seed.
D. Mix thoroughly into upper 2 inches of topsoil.
E. Lightly water to aid the dissipation of fertilizer.
3.04 HYDROSEEDING
A. Mix seed, fertilizer and mulch with water to form a homogenous, uniform slurry and apply with a hydraulic seeder at a rate as specified for each seed mix. Apply evenly in two intersecting directions.
B. Do not hydroseed area in excess of that which can be mulched on same day.
C. Do not hydroseed when wind velocity is greater than 5 miles per hour at the site.
D. Unused Loads: Once fertilizer is mixed into the slurry, no more than 30 minutes should lapse before it is applied to prevent fertilizer from burning the seed. If mixture, containing no fertilizer, remains in the tank for more than 8 hours it shall be removed from the job site at the contractor's expense.
E. Following germination, immediately re-seed areas without germinated seeds that are larger than 4 by 4 inches.

3.05 PROTECTION
A. Identify seeded areas with stakes and string around area periphery. Set string height to 24 inches. Space stakes at 48 inches.

3.06 MAINTENANCE
A. Maintain seeded areas immediately after placement until plants are well established and exhibit a vigorous growing condition.
B. Immediately remove clippings after mowing and trimming.
C. Water to prevent grass and soil from drying out.
D. Roll surface to remove minor depressions or irregularities.
E. Control growth of weeds. Apply herbicides in accordance with manufacturer's instructions. Remedy damage resulting from improper use of herbicides.
F. Immediately reseed areas that show bare spots.
G. Protect seeded areas with warning signs during maintenance period.

PART 4 - PAYMENT
A. The lump sum payment, as listed on the Bid Form, shall be full compensation for Seeding and furnishing and installing all components for complete operational system.

END OF SECTION
SECTION 32-9300

PLANTS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. New trees, plants, and ground cover.
   B. Mulch and Fertilizer.

1.02 RELATED REQUIREMENTS
   A. Section 31-2200 - Grading: Topsoil material.
   B. Section 31-2323 - Fill: Topsoil material.

1.03 DEFINITIONS
   A. Weeds: Refer to the current publication of Oregon's official noxious weed priority list at designated by the Oregon State Weed Board.
   B. Plants: Living trees, plants, and ground cover specified in this Section, and described in ANSI Z60.1.

1.04 REFERENCE STANDARDS
   B. ANSI A300 - American National Standard for Tree Care Operations - Tree, Shrub and Other Woody Plant Maintenance - Standard Practices:
      4. Part 6 - 1012 Planting and Transplanting.

1.05 SUBMITTALS
   A. See Section 01-3000 – Administrative Requirements.

1.06 QUALITY ASSURANCE
   A. Nursery Qualifications: Company specializing in growing and cultivating the plants with three years documented experience.

1.07 REGULATORY REQUIREMENTS
   A. Comply with regulatory agencies for fertilizer and herbicide composition.

1.08 SUBSTITUTIONS
   A. There shall be no additions, deletions, or substitution of plant material species without the written approval by the Architect.
   B. Substitutions of plant material shall be permitted only if approved by the Architect in writing, and if providing the substituted plant or plants are of value and character equal to those originally specified, and that substitutions are at no additional expense.
   C. Any substitution that has not been approved shall be removed and immediately replaced with the correct plant at the contractor's expense.

1.09 DELIVERY, STORAGE, AND HANDLING
   A. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.
   B. Protect and maintain plant life until planted.
   C. Deliver plant life materials immediately prior to placement. Keep plants moist.

1.10 FIELD CONDITIONS
   A. Do not install plant life when ambient temperatures may drop below 35 degrees F or rise above 90 degrees F.
B. Do not install plant life when wind velocity exceeds 30 mph.

1.11 WARRANTY
A. See Section 01-7800 - Closeout Submittals, for additional warranty requirements.
B. Warranty: Include coverage throughout maintenance period; replace dead or unhealthy plants. See Drawings for maintenance requirements.
C. Replacements: Plants of same size and species as specified, planted in the next growing season, with a new warranty commencing on date of replacement.

PART 2 PRODUCTS

2.01 PLANTS
A. Plants: Species and size identified in plant schedule, grown in climatic conditions similar to those in locality of the work.

2.02 SOIL MATERIALS
A. Refer to Section 31-2323 Fill.
B. Refer to Drawings for additional soil requirements.

2.03 SOIL AMENDMENTS
A. Obtain a Soils Agronomy Report from approved soils laboratory:
   1. A & L Western Agricultural Laboratories; 10220 SW Nimbus Avenue, Building K-9, Portland, Oregon 97223; Phone 503-598-7702; Web: www.al-labs-west.com; Email: alportland@al-labs-west.com.
   2. Or approved equal.
B. Biotic Soil Amendment, Amended Soil for Planting Areas:
   1. PermaMatrix Biotic Soil Amendment HYDRO.
      a. Composition: Organics, Microbes, Mycorrhizae, Burlap/Straw Fiber, Plant Growth Aids:
         (1) Organic Humic Compounds: 6.4 - 6.6 pH.
         (2) Blended Fiber: NA pH.
         (3) Charcoal (Biochar): 8.0 - 9.0 pH.
         (4) EcoLive Mycorrhizae: 6.0 - 7.0 pH.
         (5) Ecobiotics Microbial Suite: 6.5 - 6.7 pH.
         (6) Water Storing Organic Polymer: 6.0 - 7.0 pH.
   2. Or approved equal. Substitutions: See Section 01 60 00 - Product Requirements.
C. Contractor shall adjust soil amendments per the results of the Soils Agronomy Report.

2.04 MULCH MATERIALS
A. Bark Mulch: Double-shredded, Medium grind, Douglas Fir ground bark, free of growth or germination inhibiting ingredients, as supplied by Lane Forest Products, Eugene, Oregon, or approved equal.
   2. See Drawings for locations and depth.
B. Rock Mulch: 3 inch minus 1 inch (3”-1”) Open Round Rock, washed and without fines.

2.05 ACCESSORIES
A. Wrapping Materials: Burlap.
B. Stakes: Softwood lumber, pointed end.
C. Plant Protectors: Rubber sleeves over cable to protect plant stems, trunks, and branches.
D. Tree Protectors: Metal with galvanized rings.
E. Weed Barrier: Rot resistant, water and air permeable polypropylene fabric or equivalent.
PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that prepared subsoil and planters are ready to receive work.
B. Saturate soil with water to test drainage.
C. Verify that required underground utilities are available, in proper location, and ready for use.

3.02 FERTILIZING
A. Apply fertilizer in accordance with manufacturer's instructions.
B. Apply after initial raking of topsoil.
C. Mix thoroughly into upper 2 inches of topsoil.
D. Lightly water to aid the dissipation of fertilizer.

3.03 PLANTING
A. Notify Architect prior to planting for site inspection and approval of plant placement.
B. Set plants vertical and place for best appearance.
C. Remove non-biodegradable root containers.
D. Set plants in pits or beds, partly filled with prepared plant mix, at a minimum depth of 6 inches under each plant. Remove burlap, ropes, and wires, from the root ball.
E. Planting pits shall be of such depth that, when planted and settled, the crown of the plant shall be in the same relationship to finish grade as it did to the soil surface in original place of growth. Backfill soil mixture in 6 inch layers. Maintain plant life in vertical position.
F. Saturate soil with water when the pit or bed is half full of topsoil and again when full.

3.04 PLANT SUPPORT
A. Brace plants vertically with plant protector wrapped guy wires and stakes to the following:
   1. Tree Caliper: 1 inch; Tree Support Method: 1 stake with one tie
   2. Tree Caliper: 1 to 2 inches; Tree Support Method: 2 stakes with two ties

3.05 MAINTENANCE
A. See Drawings for maintenance requirements.

PART 4 - PAYMENT
A. The lump sum payment, as listed on the Bid Form, shall be full compensation for Plants and furnishing and installing all components for complete operational system.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Modular precast concrete manhole sections with tongue-and-groove joints, manhole frames and covers, anchorage, and accessories.
   B. Manhole Testing.

1.02 REFERENCE STANDARDS
   A. Use current adopted addition(s).

1.03 SUBMITTALS
   A. See Section 01-3000 - Administrative Requirements, for submittal procedures.

1.04 QUALITY ASSURANCE
   A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years' experience.

1.05 FIELD CONDITIONS
   A. Cold and Hot Weather Requirements: Comply with requirements of ACI 530/530.1/ERTA or applicable building code, whichever is more stringent.

PART 2 PRODUCTS

2.01 MATERIALS
   B. Mortar. Mortar shall conform to ASTM C387 or be proportioned one-part Type II Portland Cement to two parts clean, well-graded mason's sand passing a 1/8" screen. Consistency of mortar shall be such that it will readily adhere to precast concrete.
   C. Concrete cast-in-place shall conform to ASTM C94 and shall use Type II Portland Cement conforming to ASTM C150.
   D. Non-Shrink Grout. Grout shall be Sika 212, Euco N-S, Five Star, or approved equal nonmetallic cementitious commercial grout exhibiting zero shrinkage per ASTM C827. Grout shall not be amended with cement or sand and shall not be reconditioned with water after initial mixing. Nonshrink grout shall be placed and packed only with the use of an approved commercial bonding agent. Unused grout shall be discarded after 20 minutes.

2.02 MANHOLE CONFIGURATION
   A. Clear Inside Dimensions: 48-inch diameter for pipes up to 18-inches in diameter. Manholes shall have an inside diameter of 72-inch for pipes above 18-inches in diameter unless otherwise shown in the Drawings.
   B. Cone section shall be eccentric unless otherwise shown on the Drawings. Manholes less than 6 feet deep shall have flat tops with eccentric opening rather than cones.
   C. Manhole sections shall have a minimum wall thickness of 5-inches and a base thickness of 6-inches. Concrete used in forming the sections shall have a minimum compressive strength of 4000 psi at 28 days. Reinforcing steel shall be Grade 60.
   D. Clear Lid Opening: 26-inches diameter.
   E. Grade rings may be used for extensions up to 12 inches.
   F. Manholes shall have precast reinforced concrete bases with shelves, channels and slopes as specified. Precast bases shall have same wall thickness and reinforcement as riser sections.
   G. Joints between manhole sections as well as base sections shall be tongue and groove with an o-ring gasket conforming to ASTM C443 or approved equal designed to use flexible joint.
compound. Preformed gaskets shall be Ram-Nek, Kent-Seal No. 2, or approved equal. Joint compound if used shall conform to Federal Specification SS-S-00210.

H. Manholes shall have yard permeability tests passing ASTM C497 prior to delivery.

2.03 MANHOLE FRAMES AND COVERS
A. All frames and covers shall be heavy duty, gray cast iron designed for H2O traffic loading. Metal used in the castings shall conform to ASTM A48 Class 30. All castings shall be manufactured true to pattern, uniform in quality, free from blowholes, shrinkage, distortion or other defects. Component parts shall fit together in a satisfactory manner and shall have continuously machined bearing surfaces to prevent rocking and rattling. Castings shall be smooth and well cleaned by shotblasting at the factory.

B. Frames and covers shall have skid resistant surface of raised knobs or indentations.

C. Sanitary Sewer Manhole Frames and Covers
   1. Cover shall have the word "SEWER" or "SS" cast into the lid. Non-watertight lids shall have two vent holes.
   2. Frames shall be Olympic Foundry MH26A; or approved equivalent. Covers shall be Olympic Foundry MH26S; or approved equivalent.
   3. Riser rings shall be Olympic Foundry MH26R, or approved equivalent.

D. Storm Sewer Manhole Frames and Covers
   1. Storm sewer covers shall be of special casting with “Dump No Waste – Storm Drains to River” and a Salmon cast into the cover.
   2. Frames and Covers shall be D&L Supply Co. A-2107, or approved equivalent.
   3. Riser rings shall be D&L Supply Co. A-2107-R, or approved equivalent.

2.04 MANHOLE CONNECTIONS
A. Connections to precast manhole sections shall be accurately core-drilled and shall utilize a properly sized flexible rubber boot providing a watertight seal. Adapter shall be factory tested for watertightness up to 10.8 psi. Kor-N-Seal as manufactured by Trelleborg or approved equal.

B. Connections to cast-in-place concrete shall be made with a rubber waterstop grouting ring. Ring shall clamp to pipe with stainless steel clamp and have waterstop ribs. Waterstop Grouting Ring by Press-Seal Gasket Corp., or approved equal.

2.05 CLEANOUTS
A. Clean-outs shall be provided on service laterals and as shown on the Drawings. Frame and cover shall be Inland Foundry Co., Inc. Pattern No. 220; or approved equivalent. Cover shall be marked "S" or "SEWER" for sanitary sewer installations.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify items provided by other sections of Work are properly sized and located.
B. Verify that built-in items are in proper location, and ready for roughing into Work.
C. Verify excavation for manholes is correct.

3.02 PREPARATION
A. Coordinate placement of inlet and outlet pipe or duct sleeves required by other sections.

3.03 MANHOLE INSTALLATION
A. Prepare native soil and place and compact the crushed rock base to 95% maximum dry density. Place Foundation Stabilization if required. Backfill material around manholes shall be as specified for trenches.

B. Concrete base shall be carefully placed on the prepared bedding so as to be fully and uniformly supported at true grade and alignment.

C. Pipe penetrations shall be core drilled to the appropriate size for each pipe entering or exiting the manhole. Jackhammering will not be allowed.
1. Install appropriately sized KOR-N-SEAL boot on each pipe and apply non-shrink grout to remainder of wall penetration to provide positive seal. Non-shrink grout shall be as specified.
2. Install appropriately sized grout ring for pipes entering or exiting an existing manhole core drilled tap.

D. Install transition couplings within 2 feet of the outside wall of manholes on all pipes; or, a pipe bell shall be located a minimum of 1 foot to a maximum of 2 feet from the outside wall of manholes.

E. All flow channels within precast bases shall be constructed of non-shrink grout with a minimum depth of three-fourths (¾) the contributing pipe diameter. Inverts shall be true to line and grade with flow lines having a minimum drop of 0.1 feet from inlet to outlet (0.2 feet for 90 degree flow direction changes) or as shown on the Contract Drawings. Sides of channels shall be troweled smooth to prevent solids deposition. Ledges or benches shall be sloped towards channel to drain. Provide fine broom finish on ledges.

F. Clean tongue and grooves of base and wall sections, prime and apply joint sealer prior to setting in place. Ensure that joint has fully seated. Use approved flexible joint sealant and same manufacturer’s primer. The height of the lowest wall section shall be at least three (3) times the inside diameter of the largest sewer pipe entering the manhole and in no case less than 2-feet. Wall sections shall be plumb vertical.

G. Frame and covers shall be installed so that the cover is exposed and flush with the existing surface or finish grade elevation. In no case will pavement be raised or lowered to meet the grade of installed manhole frames and covers. Where manholes are installed in sloping areas, the grade of the slope shall intersect the top rim of the cover on the uphill side. Manhole frame shall be sealed to the concrete manhole section with a bed of non-shrink grout on either side of bead of flexible joint sealant. In addition, the frame and cover shall be grouted to the outside of the concrete manhole section.

H. Manhole installations with tilted or otherwise defective bases, wall sections which are not plumb, covers which do not match existing grade properly, or are otherwise not in specification compliance shall be removed by the Contractor and replaced until acceptable.

I. Place manhole sections plumb and level, trim to correct elevations, anchor to base pad.

J. Refer and comply with any applicable detail drawings for Manholes and clean-outs in the Drawings.

3.04 MANHOLE VACUUM TESTING

A. Precast concrete manholes shall be tested in accordance with the following procedure. Manhole installations which fail the testing shall be repaired or replaced until passing results are obtained. If flexible joint sealant is pulled out during testing, it shall be repaired. No payment to the Contractor will be made for such repair and/or replacement.

1. Testing shall be done in the presence of the Engineer. Notify Engineer at least 2 working days in advance.

2. All manholes shall be tested for acceptance after the trench has been backfilled, compaction requirements have been met, road base rock has been installed, paving is complete, and concrete manhole collars have been installed. If manhole has passed test and the castings have later been disturbed, manhole shall be re-tested.

3. Thoroughly clean all manholes prior to testing. Remove all debris and do not allow foreign material to enter downstream piping.

4. Contractor shall provide all necessary equipment and personnel to conduct the testing, including vacuum equipment and indicating devices.

5. Procedure:
   a. Plug all pipes entering manhole. Secure all plugs to prevent movement while vacuum is being drawn.
   b. Testing shall include the joint between the manhole cone or riser ring(s) and the manhole cover frame.
c. Installation and operation of vacuum equipment and indicating devices shall be in accordance with the manufacturer’s specifications and instructions.

d. Withdraw air from the manhole until a measured vacuum of 10-inches of mercury (10" Hg) is established in the manhole interior.

e. Record the time it takes for the vacuum to drop to 9-inches of mercury (9" Hg). Acceptance standards are based on this 1-inch of mercury change in negative pressure. Time measured for the 1" Hg pressure change shall be equal to or greater than the values in the following table:

f. Vacuum Testing Requirements (minimum test times, seconds, shown in Table below)

| Manhole Depth (ft) | MH Diameter = 42" | MH Diameter = 48" | MH Diameter = 54" | MH Diameter = 60" | MH Diameter = 72"
<table>
<thead>
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<tr>
<td>8' or less</td>
<td>17</td>
<td>20</td>
<td>23</td>
<td>26</td>
<td>33</td>
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<tr>
<td>10'</td>
<td>21</td>
<td>25</td>
<td>29</td>
<td>33</td>
<td>41</td>
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<tr>
<td>12'</td>
<td>25</td>
<td>30</td>
<td>35</td>
<td>39</td>
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<td>14'</td>
<td>30</td>
<td>35</td>
<td>41</td>
<td>46</td>
<td>57</td>
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<tr>
<td>16'</td>
<td>34</td>
<td>40</td>
<td>46</td>
<td>52</td>
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<tr>
<td>18'</td>
<td>38</td>
<td>45</td>
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<td>20'</td>
<td>42</td>
<td>50</td>
<td>53</td>
<td>65</td>
<td>81</td>
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<tr>
<td>22'</td>
<td>46</td>
<td>55</td>
<td>64</td>
<td>72</td>
<td>89</td>
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</table>

B. Hydrostatic testing of manholes may be allowed. Test shall be in accordance with ASTM C497 as modified here. Test will consist of plugging all inlets and outlets and filling the manhole with water to the rim. Leakage in each manhole shall not exceed 0.2 gallons per hour per foot of head above the invert. Leakage will be determined by refilling to the rim using a calibrated or known volume container. Testing duration shall be at least 2 hours. Testing results shall be recorded on a form approved by the Engineer.

PART 4 MEASUREMENT AND PAYMENT

4.01 Measurement and payment for Standard Manholes will be made on a unit price basis per each, at the price stated on the Bid Form. Payment will include all materials, labor, and equipment required for complete installation, including excavation and backfill around manholes, all precast components, grouting and shaping of base channels, pipe adapters, testing, temporary hard surfacing, and all else related to this item not paid under other sections.

4.02 Payment for Connections to Existing Manholes shall be as shown in the Bid Form and/or as specified in Section 33-3113 – Sanitary Utility Sewerage Piping.

END OF SECTION
SECTION 33-1113
WATER UTILITY AND DISTRIBUTION PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Pipe and fittings for site water lines including water mains, and service piping.

1.02 RELATED REQUIREMENTS
A. Section 31-2316.13 – Trenching: Excavating, bedding, and backfilling.
B. Section 33-1300 - Disinfecting of Water Utility Distribution: Disinfection of site service utility water piping.

1.03 REFERENCE STANDARDS
A. Use current adopted addition(s).

1.04 SUBMITTALS
A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data pipe materials, pipe fittings, valves, and accessories.

1.05 QUALITY ASSURANCE
A. Perform Work in accordance with municipality requirements.
B. All materials used in contact with potable water shall meet the requirements of the National Sanitary Foundation (NSF), Standard 61 and shall bear the NSF insignia.
C. Water Pipe, Fittings, and other appurtenances shall be American made.
D. Provide thrust blocking and restraint at all pipe joints as required to prevent movement under pressure testing and subsequent long-term use.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Deliver and store in shipping containers with labeling in place.

PART 2 PRODUCTS

2.01 WATER PIPE
A. Ductile Iron Pipe (DIP) and Fittings: Centrifugally cast DIP conforming to AWWA C151 and AWWA C150.
   1. Pipe Thickness: Pipe thickness shall be Class 52 minimum.
   2. Pipe and Fitting Coatings: Pipe interior shall be cement mortar lined conforming to AWWA C104. External pipe coating shall be an asphaltic coating in accordance with ANSI/AWWA C151/A21.51.
   3. Pipe Joints: AWWA C111 integral cast socket bell with SBR rubber gaskets. Joints shall be as structurally strong as the pipe itself.
      a. Water-tight joint seal. U.S. Pipe "Tyton-Joint" or approved equivalent.
      b. Restrained Joints: when required by the conditions or Drawings, restrained push-on pipe joints shall be provided.
      a. Joints shall be mechanical joint, push-on, or flange as shown in the Drawings and required by installation conditions.
      b. Mechanical Joint Fittings: Mechanical Joints (MJ) and gaskets for mechanical joint fittings shall conform to ANSI/AWWA C111/A21.11-07 Standard. Furnish with standard high-strength, low-alloy steel T-bolts and hexagonal nuts conforming to ANSI/AWWA C111/A21.11. Gasket material shall be vulcanized styrene butadiene rubber (SBR) or ethylene propylene rubber (EPDM) in accordance with ANSI/AWWA C111/A21.11.
(1) MJ restraints shall be used for all MJ fittings unless otherwise specified. Joint restraints shall be specifically designed for the pipe material being used (PVC, DIP, etc.). Device shall be cast from Grade 65-45-12 ductile iron in accordance with ASTM A536 and shall consist of multiple gripping wedges incorporated into the following gland. Device shall not reduce the standard deflection capabilities of MJ fittings. Device shall have a rated working pressure of at least 350 psi with a safety factor of not less than 2 to 1. "MEGALUG" by EBAA Iron, Ford Meter Box Uni-Flange Restraint, or approved equivalent.

c. Flanged fittings: Faced and drilled to standard 125-pound template per ANSI Class 125 B16.1 Standard unless ANSI Class 250 B16.1 fittings are indicated on Drawings. Flange thickness shall conform to ANSI/AWWA C115/A21.15-05.

(1) Flange Gaskets shall be 1/8-inch thick SBR rubber per ANSI/AWWA C111/A21.11 Appendix C, Sec. C.2 with at least (3) three bulb type rings molded into both faces of the gasket. Gaskets shall be full face style with holes for bolts. Flat rubber gaskets and/or thinner gaskets are not approved.

(2) Bolts and nuts shall be stainless steel or cadmium plated with anti-seize lubricant.

5. Ductile Iron Pipe and Fittings shall be as manufactured by: US Pipe, Tyler Pipe, McWane, Inc., or approved equivalent.

B. PVC Pipe, AWWA C900: Rigid PVC pipe, 4-inch through 12-inch nominal diameter, conforming to all requirements of AWWA C900, Polyvinyl Chloride Pressure Pipe. Shall be made from quality PVC resin compounded to provide physical and mechanical properties that equal or exceed cell class 12454 as defined in ASTM D1784. Pipe shall be designated for use as water supply and distribution pressure pipe, and shall conform to the outside diameters of cast iron pipe.

1. Pipe furnished shall be Pressure Class 165 (tested to 250 psi) rated for 165 psi (DR 18)
2. Pipe to be furnished in 20 foot lengths with integral wall-thickened bell ends.
3. Fittings: AWWA C111, ductile iron conforming to those specified above for DIP.
4. Joints: The bell joint shall consist of an integral wall section with a bonded-in elastomeric gasket manufactured in conformance with the requirements of ASTM F477. Gaskets shall be Rieber type to resist rolling during installation. The bell section shall be designed to be at least as hydrostatically strong as the pipe wall and meet the requirements of AWWA C900 and ASTM D3139.
5. A non-toxic vegetable soap lubricant shall be supplied by the pipe manufacturer with pipe.
6. C900 PVC Pipe shall be as manufactured by: JM Eagle, CertainTeed, North American Pipe Corporation, or approved equivalent.

C. Polyethylene Pipe: AWWA 901: Service lateral piping, 1-inch through 2-inch (1-inch minimum size allowed), shall be high density polyethylene (PE 3408) pipe conforming to AWWA C901.

1. NSF listed, ASTM 2737 SDR7, 200 psi rating, standard CTS sizes.
2. Pipe shall be solid blue in color or black with blue stripes.
3. Fittings: All fittings shall be standard pack joints for CTS tube.
   a. Ford Meter Box Grip Joint for CTS and Quick Joint for CTS or equal.
   b. Stainless steel internal pipe stiffeners as required at each pack joint connection.

2.02 TRACER WIRE AND WARNING TAPE

A. Tracer Wire: Provide detectable tracer wire along all non-metallic water pipes.

1. Tracer Wire shall be No. 12 AWG minimum, solid copper.
2. Insulation shall be 0.045-inch think HDPE designed for direct bury.
3. Insulation for tracer wire along water piping shall be blue in color.
4. Wire shall be placed on pipe and taped every 5 feet with a small amount of slack to keep the wire straight along the pipe.
B. Warning Tape. Provide warning tape in trench over all installed pipelines.
   1. Underground warning tape shall be 6-inch wide, 4-mil-thick, APWA Standard Blue color, reading "CAUTION – WATER LINE BURIED BELOW."
   2. Warning tape shall be placed over the pipe zone material, approximately 15 to 18 inches below finish grade. Lay tape flat and untwisted, centered over the pipe and with wording facing upwards.

2.03 BEDDING AND COVER MATERIALS
   A. Pipe Bedding Material: As specified in Section 31-2316 - Excavating.
   B. Pipe Cover Material: As specified in Section 31-2316 - Excavating.

2.04 ACCESSORIES
   A. Concrete for Thrust Restraints shall meet ASTM C94 with a 28-day compressive strength of at least 3000 psi. Reinforcement shall meet ASTM A615, Grade 60.

PART 3 EXECUTION

3.01 PREPARATION
   A. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs.
   B. Remove scale and dirt on inside and outside before assembly.
   C. Prepare pipe connections to equipment with flanges or unions.

3.02 TRENCHING
   A. See Section 31-2316.13 for additional requirements.

3.03 PIPE INSTALLATION
   A. Install ductile iron piping and fittings to AWWA C600 and manufacturer's instructions. Contractor shall have on site all proper tools and equipment to properly and safely install the pipe.
   B. PVC pipe shall be installed and handled in accordance with the Manufacturer's Installation Guide, the Uni-Bell Uni-PUB-09, AWWA C605, and these specifications. Contractor shall have on site all proper tools and equipment to properly and safely install the pipe.
   C. Properly prepare trench and trench bedding. Do not construct trench in a manner which requires bending of the pipe. Utilize fittings rather than bending pipe.
   D. Provide concrete thrust blocking at all bends, valves, tees and other fittings in accordance with the Plans, as required to prevent movement due to thrust.
   E. Prior to lowering pipe into the trench, the Engineer will check for damage to the pipe. The Contractor shall repair or replace, as directed, all damaged or flawed pipe prior to installation.
   F. Thoroughly clean inside the pipe before laying. Prevent foreign material from entering the pipe while it is being placed in the trench. Remove all foreign material from the inside of the pipe and joint before the next pipe is placed. Keep debris, tools, rags or other materials out of the pipe at all times. When pipe laying is not in progress, cover the exposed end of the pipe using a watertight expanding plug, or by other approved means to prevent entry of trench water or other foreign materials into the pipe.
   G. Lay pipe with bell ends facing the direction of laying. For lines on an appreciable slope, face bells up-grade unless otherwise directed by the Engineer.
   H. At no time shall pipe be deflected at a joint, either in the vertical or horizontal plane, in excess of the maximum deflection recommended by the pipe manufacturer or 3 degrees, whichever is less. Maximum deviation from grade shall not exceed ½-inch. No deflection is allowed at push-on joints.
   I. Where new water pipe is installed near existing or new sanitary sewer lines, all provisions of current OAR 333-61-050 (Crossings - Sanitary sewers and waterlines), regarding placement of pipe near, under, or over sanitary sewer lines shall be followed.
J. Thoroughly clean the ends of the pipe to remove all foreign matter from the pipe joint. Lubricate the bell and spigot ends with NSF approved pipe lubricant, as recommended by the manufacturer.

K. Install pipe to allow for expansion and contraction without stressing pipe or joints.

L. Install access fittings to permit disinfection of water system performed under Section 33-1300.

M. Place tracer wire properly before pipe zone fill is complete. Place warning tape as specified. Complete trench fill.

3.04 FIELD QUALITY CONTROL

A. Filling and Flushing Water Piping

1. After installation of water piping, fill pipes slowly while venting all air. Fill with potable water at a maximum rate to maintain 2 fps or less. Take all required precautions to prevent entrapping air in the pipes. Flush all sections of pipe to remove any solids or material that may be in the pipe. If no hydrant is installed at the end of the main, provide a tap large enough to develop sufficient flow rates to achieve a velocity between 3 to 5 feet per second in the main. Control and dispose flushing water in a proper manner to avoid erosion, flooding, property damage, and discharge of chlorinated water in an unacceptable manner.

2. All waterlines shall be flushed as specified herein as to remove any foreign material. The contractor shall provide all fittings and backflow preventions as required to perform the flushing.

3. In addition to flushing, all waterlines six (6) inches and larger shall be “pigged” as specified herein to remove any foreign mater.
   a. “Pigging” shall be accomplished prior to hydrostatic testing and disinfection.
   b. A minimum of three (3) pigs shall be flushed through the waterlines. The Contractor has the option of running all three pigs at the same time or running the pigs one at a time. Identify individual pigs if all three pigs are to be ran simultaneously.
   c. Pigs shall be polyurethane form as manufactured by Knapp Poly Pig, Inc. or as approved by Engineer.
   d. It shall be the responsibility of the Contractor to flush the pigs through the waterlines and retrieving pigs after the test. If one or more pigs fails to run the complete length of the waterline, Contractor shall be responsible for retrieving the pigs and repeating the test.
   e. Contractor shall provide erosion control as required to prevent damage to surrounding vegetation and existing ground.
   f. The Contractor shall re-pig the waterlines as required if after pigging and disinfection of the treated waterlines, the bacteriological test fails.
   g. Contractor shall notify Engineer and Owner a minimum of 24-hours prior to pigging the waterlines. Engineer can require waterlines to be re-pigged if excessive foreign material is encountered during pigging.
   h. The contractor shall be required to temporarily remove and replace any reducers, pipe spools and fittings as required placing and removing pigs for the flushing.

B. Pressure Testing Water Piping

1. Hydrostatic pressure testing shall be conducted after the waterline has been flushed.

2. All waterlines and service lines shall be subjected to hydrostatic pressure testing. Testing shall be conducted by the Contractor in the presence of the Engineer or Owners representative. Engineer and Owner shall be notified at least 2 working days in advance.

3. Testing shall not be commenced until all thrust blocking has been in place for not less than 10 days and sufficient backfill has been placed to prevent pipe movement.

4. Furnish and operate all pumps, gauges, plugs, saddles, corporation stops, miscellaneous hose and piping, and measuring equipment necessary for performing the test. Provide certifications of accuracy for gauges from an approved laboratory when requested.
5. Perform pressure testing with hydrant auxiliary gate valves open and pressure against the hydrant valve. After the pipe test is completed, test each gate valve in turn by closing it and relieving the pressure beyond. This test of the gate valve is acceptable if there is no immediate loss of pressure.

6. All visible leaks on new waterlines shall be repaired, regardless of the amount of leakage.

7. Test Procedure - Rigid Piping (PVC, D.I.)
   a. The test section shall be slowly filled with water and all air expelled from the pipe prior to testing.
   b. All valves isolating the test section shall be securely closed and the specified test pressure applied by means of a pump connected near the lower end of the test section.
   c. The test pressure shall be 150 psi and the duration shall be at least 2-hours at the test pressure. Provide additional pumping during the test period to continuously maintain pressure within 5 psi of that required (PVC and D.I. pipe only). Use a clean container of potable water to supply the pump.
   d. Accurately determine the quantity of water required to maintain and restore the required pressure at the end of the test by pumping through an approved positive displacement water meter.
   e. The allowable leakage rate for the test section shall be determined from the following formula where \( L = \) allowable leakage (gph), \( S = \) length of pipe being tested, \( D = \) nominal diameter of pipe (inches), and \( p = \) average test pressure (psi):

\[
L = \frac{SD\sqrt{p}}{148,000}
\]

8. Compare the amount of water added during the test to the allowable leakage for the test section. If the amount of water added is less than the allowable leakage, then the section shall be considered to have passed hydrostatic testing and the Contractor may proceed with disinfection. If the amount of water added to the section exceeds the allowable leakage, the Contractor shall, at his own expense, determine the source of leakage, repair or replace the defective elements, and repeat the test until the pipeline withstands the test pressure and the allowable leakage requirements have been satisfied.

C. See Section 33-1300 – Disinfecting of Water Utility Distribution for disinfection requirements.

**PART 4 - PAYMENT**

4.01 MEASUREMENT AND PAYMENT

A. Waterlines.

1. Payment shall be made on a lineal foot basis for each size. Measurement for payment quantities shall be based on horizontal length for each size. Payment shall include compensation for trench excavation, backfill, pipe zone, pipe, fittings, restraints, blocking, warning tape, toning wire, flushing, testing and disinfection, incidental materials, labor, equipment, and all incidental work required to complete the work. No separate payment shall be made for temporary end plugs, and other equipment and materials required for flushing, disinfection and testing, which are considered incidental to this work.

**END OF SECTION**
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Gate valves, backflow preventer assemblies (and fiberglass enclosures), hydrants, and other water system related appurtenances.

1.02 RELATED REQUIREMENTS
   A. Section 31-2316 - Excavation: Excavating of trenches.
   B. Section 31-2316.13 – Trenching: Excavating, bedding, and backfilling.
   C. Section 31-2323 - Fill: Bedding and backfilling.
   D. Section 33-1300 - Disinfecting of Water Utility Distribution: Disinfection of site service utility water piping.

1.03 REFERENCE STANDARDS
   A. Use current adopted addition(s).

1.04 SUBMITTALS
   A. See Section 01-3000 – Administrative Requirements.
   B. Product Data: Provide data on pipe materials, pipe fittings, valves, enclosures, and accessories.
   C. Project Record Documents: Record actual locations of piping mains, valves, connections, thrust restraints, and invert elevations. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.05 QUALITY ASSURANCE
   A. Perform Work in accordance with municipality requirements.
   B. All materials used in contact with potable water shall meet the requirements of the National Sanitary Foundation (NSF), Standard 61.
   C. Water Valves and other appurtenances shall be American made.
   D. Provide thrust blocking and restraint at all pipe joints as required to prevent movement under pressure testing and subsequent long-term use.

1.06 DELIVERY, STORAGE, AND HANDLING
   A. Deliver and store valves in shipping containers with labeling in place.

PART 2 PRODUCTS

2.01 SHUT-OFF VALVES
   A. Valves: Manufacturer’s name and pressure rating shall be marked on valve body. Unless otherwise indicated on the drawings, standard shut-off valves in waterlines 2" through 12" shall be resilient wedge gate valves. Special note shall be taken of the various end connections (flange, mechanical joint, thread, etc.) required for each valve. Buried valves shall be furnished with specified valve boxes and lids and shall include a stem extension where required to bring the operating nut to within 2 feet of finish grade when the valve nut is greater than 3 feet from finish grade otherwise.
   B. Gate Valves 2" through 12”:
      1. AWWA C509, iron body, resilient seat, non-rising stem (NRS), wedge gate valves. Valves shall be manufactured to open when the stem is rotated counterclockwise. Provide a 2-inch square operating nut unless otherwise specified. Valve end configurations and sizes shall be as shown on the Plans. All valves shall be 250 psi working pressure, 500 psi test pressure.
a. All internal parts shall be accessible without removing the body from the line. Pressure retaining surfaces shall have O-rings and no flat gaskets.
b. Wedge shall be cast iron completely encapsulated with resilient material. The resilient materials shall be permanently bonded to the wedge meetings ASTM D429.
c. Stems shall be cast copper alloy. Valve hardware shall be stainless steel.
d. Valve shall be fully (body, bonnet, and o-ring plate) fusion bonded epoxy coated inside and out in accordance with AWWA C550.
e. Bolts and nuts for valve connections to main line shall be cadmium plated.

2. Valves shall be Kennedy Valve Model KS-FW; Mueller 2360 Series; Clow; or approved equivalent.

2.02 VALVE BOXES
A. Valve Boxes.
   1. Cast iron traffic rated valve boxes and lids shall be furnished and installed with all buried gate valves.
   2. Boxes shall be two-piece (top and base) adjustable length for varying installation conditions, with a slip type means of adjustment, and a top flange. Box shall be suited for valve size.
   3. Shaft shall be 7-inch inside diameter. Cover shall be “pocket” type and lettered “WATER”.
   4. Shaft extensions shall be provided where required.
   5. Boxes shall be Olympic Foundry VB 910, US Filter Heavy Duty 910 or equal.

2.03 BACKFLOW PREVENTION ASSEMBLY VALVES
A. Potable Water Reduced Pressure Assembly, ANSI/AWWA C511
   1. Provide one Reduced-Pressure Assembly as shown on the Drawings. Device must be approved by the OHA Drinking Water Services.
   2. Orientation: Inlet and outlet flow vertical.
   3. Ductile iron Grade 65-45-12 main and relief valve body, stainless check seats, and disc holder, silicone elastomer disc and stainless steel spring.
   4. Fusion epoxy coated internal and external per AWWA C550.
   5. UL/FM approved OS & Y AWWA C515 resilient wedge valves for shut-off on each side.
   7. Working pressure of 175 psi minimum. 350 psi hydrostatic test pressure.
   8. Valve: Febco Master Series 4-inch LF 880V-OSY or approved equivalent.
   9. Accessories:
      a. Valve Setter: Febco 611 Flange X Flange or equivalent.
      b. Fiberglass Enclosure: ASSE 1060 Certified insulated fiberglass enclosure for exterior use with 1/8” thick yacht quality fiberglass shell and minimum 1.5” thick polyisocyanate foam insulation. Enclosure shall be anchored to concrete pad with interior stainless steel anchors and shall include full port one-way deck drain provisions. Enclosure shall have lockable swing-out, removable access panels on two sides and lockable flip-top lid to allow maintenance access to valve without removal of enclosure. Hubbel HotBox No. LM041041045 (old No. LB4FEM) or approved equivalent.

B. Irrigation Reduced Pressure Assembly, ANSI/AWWA C511
   1. Provide one Angle Pattern Reduced-Pressure Assembly as shown on the Drawings. Device must be approved by the OHA Drinking Water Services.
   2. Orientation: Horizontal.
   4. Integral flanged union connections at 45 degrees.
   5. Includes bronze/stainless steel ball valve shut-offs at each end.
7. Working pressure of 175 psi minimum. 350 psi hydrostatic test pressure.
8. Valve: Febco Model LF825YA, or approved equivalent.
9. Accessories:
   a. Fiberglass Enclosure: ASSE 1060 Certified insulated fiberglass enclosure for exterior use with 1/8” thick yacht quality fiberglass shell and minimum 1.5” thick polyisocyanate foam insulation. Enclosure shall be anchored to concrete pad with interior stainless steel anchors and shall include full port one-way deck drain provisions. Enclosure shall have lockable swing-out, removable access panels on two sides and lockable flip-top lid to allow maintenance access to valve without removal of enclosure. Hubbell HotBox No. HF013027023 LB1 or approved equivalent.
10. See Irrigation Drawings and Section 32-8423 – Landscape Irrigation for additional requirements.

2.04 COUPLINGS
   A. Transition, reducing, and straight couplings, 2-inch through 12-inch, shall have cast ductile iron or carbon steel body, and resilient gaskets. TPS Hymax 2000 Series; Romac 501; or approved equal.

2.05 BEDDING AND COVER MATERIALS
   A. Bedding: As specified in Section 31-2316.13 - Trenching.
   B. Cover: As specified in Section 31-2316.13.

2.06 ACCESSORIES
   A. Concrete for Thrust Restraints shall meet ASTM C94 with a 28-day compressive strength of at least 3000 psi. Reinforcement shall meet ASTM A615, Grade 60.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that correct location is being used for installation of water equipment and that approved equipment is on site.

3.02 PREPARATION
   A. Remove scale and dirt on inside and outside before assembly.
   B. Prepare pipe connections to equipment with flanges or unions.

3.03 TRENCHING
   A. See the sections on excavation and fill for additional requirements.
   B. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, then complete backfilling.

3.04 INSTALLATION - VALVES AND HYDRANTS
   A. Set valves on solid bearing. Comply with manufacturer’s instructions and any details in the Drawings.
   B. Center and plumb valve box over valve. Set box cover flush with finished grade.
   C. Operate valves fully open and fully close to check proper operation.

3.05 FIELD QUALITY CONTROL
   A. See 33-1300 for Disinfection requirements.

PART 4 PAYMENT

4.01 VALVES
   A. Measurement and payment for valves will be made on a per each basis for the type and size of valves specified and installed, for the unit price as stated in the Bid Form. No separate or additional payment will be made for nuts, bolts, washers, valve boxes, stem-extensions, concrete blocking and other valve related hardware or supplies.
4.02 VALVE BOXES
   A. No separate measurement and payment for valve boxes will be made, it being understood that payment for boxes is included as a portion of the unit price bid amount stated in the Bid Form for various valves.

4.03 THRUST AND RESISTANCE BLOCKING
   A. No separate measurement and payment for thrust or resistance blocking will be made, it being understood that payment for blocking is included as a portion of the unit price bid amount stated in the Bid Form for the various fittings and valves.

4.04 SERVICE LATERAL SADDLES, BALLCORP CORP STOP, OR GATE & ANGLE METER STOP
   A. Measurement and payment for water service lateral saddles will be made at the unit price for each size and type of service saddle installed. The unit price per each shall constitute full compensation for excavation and installation of service saddle, corporation stop or gate valve and angle meter stop.

4.05 REDUCE PRESSURE ASSEMBLY
   A. Measurement and payment for reduced pressure assemble will be made on a per each basis for the type and size of valves specified and installed, for the unit price as stated in the Bid Form. No separate or additional payment will be made for nuts, bolts, washers, valve boxes, stem-extensions, concrete blocking and other valve related hardware or supplies.

END OF SECTION
SECTION 33-1300
DISINFECTING OF WATER UTILITY DISTRIBUTION

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Disinfection of Water Utility Distribution Piping, fittings, valves, and other appurtenances in contact with potable water.
   B. Testing and reporting results.

1.02 RELATED REQUIREMENTS
   A. Section 33-1113 - Water Utility Distribution Piping
   B. Section 33-1200 - Water Utility Distribution Equipment

1.03 REFERENCE STANDARDS
   A. Use current adopted addition(s).

1.04 SUBMITTALS
   A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
   B. Test Reports: Indicate results comparative to specified requirements.
   C. Disinfection report:
      1. Type and form of disinfectant used.
      2. Date and time of disinfectant injection start and time of completion.
      3. Test locations.
      4. Initial and 24-hour disinfectant residuals (quantity in treated water) in ppm for each outlet tested.
      5. Date and time of flushing start and completion.
      6. Disinfectant residual after flushing in ppm for each outlet tested.
   C. Bacteriological report:
      1. Date issued, project name, and testing laboratory name, address, and telephone number.
      2. Time and date of water sample collection.
      3. Name of person collecting samples.
      4. Test locations.
      5. Initial and 24-hour disinfectant residuals in ppm for each outlet tested.
      6. Coliform bacteria test results for each outlet tested.

PART 2 PRODUCTS
2.01 DISINFECTION CHEMICALS
   A. Chemicals: AWWA B300, Hypochlorite, AWWA B301, Liquid Chlorine, AWWA B302, Ammonium Sulfate, and AWWA B303, Sodium Chlorite.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify that piping system has been cleaned, inspected, and pressure tested.
   B. Schedule disinfecting activity to coordinate with start-up, testing, adjusting and balancing, demonstration procedures, including related systems.

3.02 DISINFECTION
   A. All potable water distribution lines installed or modified under this Contract shall be sterilized prior to connection to the existing system, in accordance with the following procedure, AWWA Standards C651 through C654, and current OAR 333-61-050 (Disinfection or Facilities).
B. Flushing and passing hydrostatic testing must be accomplished prior to disinfection.

C. The Contractor shall have the option of utilizing either a liquid chlorine gas-water mixture, direct fed chlorine gas, or a calcium hypochlorite and water mixture for disinfection.

D. Disposal of chlorinated water from the pipelines shall be performed in conformance with the most recent draft or edition of Best Management Practices for the Disposal of Chlorinated Water by the Oregon Department of Environmental Quality. Chlorinated water used for disinfection of waterlines and service lines shall not be directly disposed of into or impair the waters of the State (i.e. lakes, creeks, streams and wetlands).

E. The Contractor shall provide all equipment, materials, and workmanship required to complete the flushing and disinfection of waterlines and appurtenances. Engineer shall be notified 2 working days in advance of planned disinfection procedures.

F. Disinfection Procedure:
   1. The Contractor shall inject chlorine solution into the waterline. Solution shall have a free chlorine residual of at least 25 mg/L, but not more than 100 mg/L. All entrapped air shall be discharged from the line and all surfaces shall be wetted. Chlorinated water shall be retained in the pipe for at least 24-hours. A free residual of not less than 10 mg/L shall be found in all parts of the line after the 24-hour period has elapsed.
   2. After the 24-hour period, all valves in the mainline shall be operated and all hydrants flushed with a free residual of at least 10 mg/L being found. If the residual concentration within any part of the chlorinated section is found to be less than 10 mg/L, the Contractor shall flush, rechlorinate, and retest all sections until a 10 mg/L minimum residual is obtained.
   3. Upon obtaining the minimum 10 mg/L free residual following the 24-hour disinfection period, the Contractor shall flush the section with potable water until the chlorine residual is equivalent to the residual of the existing system water. A minimum of one sample shall then be collected from the pipe for microbiological analysis.

G. Microbiological Sampling and Analysis
   1. The Contractor is responsible for collecting and submitting samples to a certified independent testing laboratory for microbiological analysis.
   2. The Engineer or District representative shall be present to witness the collection of the water samples for testing. Chain of custody procedures shall be utilized during the collection and transport of samples to the laboratory.
   3. The Contractor shall bear all costs associated with the required testing, including laboratory fees, materials required, and transportation costs. The Contractor also shall pay for all additional tests required as a result of failing to meet the bacterial limits.
   4. If the results of the microbiological analysis indicates that the water is free of coliform organisms, the waterline may be put into service.
   5. If the results of the microbiological analysis indicate that coliform organisms are present, then the waterline shall be flushed, rechlorinated, and retested until a coliform-free sample is obtained.

H. A minimum of one sample from each separable structure or pipeline shall be obtained for analysis. The presence of coliform organisms shall be determined using the Colilert 24-hour test, Method MMO-Mug, or other methods approved by the Oregon State Drinking Water Program.

3.03 FIELD QUALITY CONTROL
   A. Notify Engineer prior to testing for opportunity to witness.
   B. Test samples in accordance with AWWA C651.
PART 4 PAYMENT

4.01 WATER UTILITY DISTRIBUTION SYSTEM

A. No separate measurement and payment for disinfection of water utility distribution system will be made, it being understood that payment is included as a portion of the unit price bid amount stated in the Bid Form.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
A. Sanitary sewerage drainage piping, fittings, and accessories.

1.02 RELATED REQUIREMENTS
A. Section 31-2316 – Excavation: Excavating for buildings, paving, etc.
B. Section 31-2316.13 - Trenching: Excavating, bedding, and backfilling.
C. Section 31-2323 – Fill: Bedding and backfilling
D. Section 33-0513 - Manholes and Structures.

1.03 DEFINITIONS
A. Bedding: Fill placed under, beside and directly over pipe, prior to subsequent backfill operations.

1.04 REFERENCE STANDARDS
A. Use current adopted addition(s).

1.05 SUBMITTALS
A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data indicating pipe, pipe accessories, and other items proposed.
C. Project Record Documents:
   1. Record location of pipe runs, connections, cleanouts, and invert elevations.
   2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

PART 2 PRODUCTS

2.01 SEWER PIPE MATERIALS
A. Gravity Sewer Plastic Pipe: ASTM D3034, Type PSM, Poly(Vinyl Chloride) (PVC) material; inside nominal diameter of 4 to 15 inches, bell and spigot style gasketed joint end.
   1. Gravity sewer pipe shall be SDR 35 (PS46) and shall be furnished in 20-foot lengths. Pipe shall be green in color.
   2. PVC compounds shall meet the requirements of ASTM D1784, cell classification 12454-B.
   3. Bells shall consist of an integral wall section with a solid cross-section rubber ring, factory assembled, and securely locked in place to prevent displacement during assembly. Spigot ends shall be supplied from the factory with beveled ends. Joints shall provide a tight flexible seal meeting the requirements of ASTM D3212. Material used for elastometric seal in push-on joints shall meet the requirements of ASTM F477.
   4. All fittings and accessories shall be as manufactured and furnished by the pipe supplier, or approved equal, and shall have bell and/or spigot configurations compatible with that of the pipe. Fittings shall meet the same requirements as the pipe.
   5. All fittings and appurtenances required to construct laterals and cleanouts shall be PVC and provided by or approved by the same manufacturer as the sewer piping. This shall include all tees, caps, wyes, couplings and other required fittings.
   6. Pipe and fittings shall be Ring-Tite PVC Gravity Sewer Pipe and Fittings as manufactured by JM Eagle, Crestline Pipe, Diamond Plastics; or approved equal.
B. Ductile Iron Sewer Pipe: 4“ – 12” Ductile iron pipe shall be Class 52 minimum thickness, conforming to ANSI/AWWA C151/A21.51 under method of design outlined in ANSI/AWWA C150/A21.50. External pipe coating shall be an asphaltic coating in accordance with ANSI/AWWA C151/A21.51. Internal lining shall be Protecto 401 designed for sanitary sewer service.
2.02 PIPE ACCESSORIES

A. Transition couplings and same diameter couplings for new sewer lines, unless otherwise specified, shall be flexible rubber with stainless steel bands. Fernco, or approved equal. Rotate coupling so type and size wording is visible from top to allow for inspection.

B. PVC pipe connections to concrete manholes shall utilize appropriately sized flexible, watertight seal adapters designed for such use. See Section 33-0513 for adapter specifications.

C. Service lateral connections to new sewer mains shall utilize manufactured tees or wyes as shown on the Plans or required by the Owner. New tees or wyes shall also be cut into existing mains where use of saddles is not feasible or when so directed by the Engineer.

D. Non-Shrink Grout. Grout shall be Sika 212, Euco N-S, Five Star, or approved equal nonmetallic cementitious commercial grout exhibiting zero shrinkage per ASTM C827. Grout shall not be amended with cement or sand and shall not be reconditioned with water after initial mixing. Nonshrink grout shall be placed and packed only with the use of an approved commercial bonding agent. Unused grout shall be discarded after 20 minutes.

E. Tracer Wire: Provide detectable tracer wire along all non-metallic sewer pipes.
   1. Tracer Wire shall be No. 12 AWG minimum, solid copper.
   2. Insulation shall be 0.045-inch thick HDPE designed for direct bury.
   3. Insulation for tracer wire along water piping shall be green in color.
   4. Wire shall be placed on pipe and taped every 5 feet with a small amount of slack to keep the wire straight along the pipe.
   5. Tracer wire shall be inside the manhole and not on the exterior.

G. Warning Tape. Provide warning tape in trench over all installed pipelines.
   1. Underground warning tape shall be 6-inch wide, 4-mil-thick, APWA Standard Green color, reading “CAUTION – SEWER LINE BURIED BELOW.”
   2. Warning tape shall be placed over the pipe zone material, approximately 12 inches above the pipe. Lay tape flat and untwisted, centered over the pipe and with wording facing upwards.

2.03 BEDDING AND COVER MATERIALS

A. Pipe Bedding Material: As specified in Section 31-2316.
B. Pipe Cover Material: As specified in Section 31-2316.

PART 3 EXECUTION

3.01 TRENCHING

A. See Section 31-2316.13 for additional requirements.

3.02 PIPE INSTALLATION

A. PVC gravity pipe shall be installed, stored and handled in accordance with the manufacturer’s installation guide, the Uni-Bell PVC Pipe Association Installation Guide for PVC Sewer Pipe, ASTM D2321, and these specifications.

B. Remove material from job site, which in the judgment of the Engineer is damaged, not as specified, or otherwise rejected. Payment will not be made for damaged or rejected materials, their removal, or for repairs to such materials.

C. Preparation of Trench and place pipe and backfill in accordance with Section 31-2316.13 - Trenching. Keep trench free from water in accordance with Section 31-2319 - Dewatering.

D. Tolerance. For gravity pipelines, vertical deviation from true grade shall not exceed 0.02 feet (0.24 inch). Horizontal tolerance for deviation from line shall be 0.03125 feet (3/8 inch). Depressions or bellies which create the potential for solids deposition are not allowed.

E. Service laterals shall be installed at a minimum 2% slope from the mainline or manhole to the connection with the existing lateral from the building, unless otherwise approved by the Engineer. Provide couplings for connection to existing service laterals.

F. Service Lateral Connections
1. Service lateral connections shall include the connection of any new or existing service lateral to the main at locations shown on the Plans and as required to reconnect existing service laterals previously unknown.

2. The Contractor shall install new PVC tees with manufactured bends as shown on the Standard Details. Service lateral piping shall be extended from the new main or manhole to the connection with the existing lateral from the building.

3. The Contractor shall provide a minimum of 1-hour notice to any existing user prior to cutting the user’s service lateral and thereby disrupting service. Lateral replacement shall be completed within 4-hours or the Contractor will be required to provide bypass pumping for the affected service.

4. The Contractor shall be responsible for all exploratory excavation necessary to locate service laterals.

5. Service laterals shall be neatly cut at the point of connection and removed to the point of connection to the mainline. Reconnection to existing lateral piping shall be made using an appropriately sized transition coupling, as specified.

6. Where existing tees on the sewer main are cracked, broken, or otherwise unusable, the Contractor shall install a new tee and necessary piping in order to provide a watertight connection for the lateral.

G. All pipes shall be thoroughly flushed with water. Removal of water and debris shall be accomplished by exposing the pipe on the low end of the gravity main in each section and pumping water from the trench to the ground surface for disposal. The Contractor shall be responsible for the removal of all debris that enters into the sewer system from construction. All costs associated with removal of such debris shall be the responsibility of the Contractor and result in no additional costs to the Owner.

E. After installation and compaction of backfill, all pipe shall be thoroughly flushed and then subject to either hydrostatic or low-pressure air testing.

3.03 MANHOLE CONNECTIONS

A. Where shown on the Plans or directed by the Engineer, the Contractor shall connect new sewer piping to existing manholes.

B. Core drill the manhole wall using appropriately sized core drill for the new pipe. Jack hammering will not be allowed. Install pipe in accordance with Section 33-0513 using KOR-N-SEAL boot.

C. When an existing manhole has a poured-in-place base or other obstruction at the pipe level and core drilling is not feasible, contractor may jackhammer to provide penetration for new or replacement pipe. Install pipe in accordance with Section 33-3113 using Waterstop Grouting Ring.

D. Install flexible transition couplings on all pipes within 2 feet of the outside walls of manholes. Provide a watertight connection.

3.04 PLUG AND ABANDON PIPING/LATERALS

A. Where called for on the Plans or directed by the Engineer, install an appropriately sized mechanical plug at least 2 feet into the designated mainline or lateral pipe.

B. Concrete slurry for sealing sewer lines and laterals being abandoned shall consist of 2 sacks of Portland Cement per cubic yard of cement sand. Water shall be added at such a ratio as to provide a 4-inch slump.

C. Concrete slurry shall be packed into the end of the pipe up to the mechanical plug and troweled flush with the end of the pipe.

3.05 DEFLECTION TESTING OF FLEXIBLE PIPE

A. Conduct deflection tests of sanitary sewers constructed of flexible pipe prior to wearing surface paving. Conduct the testing by pulling an approved mandrel through the completed pipeline. Use a mandrel having at least 6 vanes and a diameter 95 percent of the pipe's initial inside diameter.
B. Conduct on a manhole-to-manhole basis after the line has been completely flushed out with water. Conduct the tests not less than 30 days after the trench backfill and compaction have been completed. Tests may be conducted sooner if approved by the Engineer. The tests may be conducted concurrently with video inspection. If conducted concurrently, pull the mandrel in front of the camera so that the deflection testing is clearly recorded on the video tape unless approved by the Engineer. Provide a water depth gauge, located on the video camera side of the mandrel with the following characteristics:

- Graduated with marks at 0.50 inch increments clearly visible during video inspection.
- Capable of measuring water depth in 0.50 inch increments from 0.50 inch to 2.50 inches.
- Designed so that it will remain plumb regardless of the rotation of the mandrel or video

### 3.06 VIDEO INSPECTION OF GRAVITY SANITARY SEWER SYSTEMS

A. All gravity sewer lines constructed as part of the project shall be televised and taped at the end of construction prior to acceptance as per Section 33-0130.

B. Any sections of sewer pipe not meeting specifications or exhibiting defects shall, at the Contractor’s expense, be corrected to meet specification. Repaired sections shall be re-televised. All repairs must be completed before acceptance of the project.

C. The sanitary sewer lines constructed as part of the project will also be video inspected near the end of the one-year warranty period by the Owner to determine if any defects exist in the system.

D. Contractor is responsible to provide the specified video inspections and shall notify the Owner and Engineer at least 48-hours in advance of planned televising. Two copies on DVD in conventional video format (DVD format, .mp4, .mov, .wmv) shall be provided to the Owner for review for each inspection. A written TV Inspection Report shall accompany the video. Video must be clear, with stationing or distance indicated, in color, with proper focus and lighting. Any video that is unacceptable in quality in the Engineer or owner’s opinion shall be redone at Contractor’s expense.

### PART 4 MEASUREMENT AND PAYMENT

#### 4.01 PAYMENT

A. Sanitary Sewer Pipe. Measurement and payment for sanitary sewer pipe installation will be made on a linear foot basis for the size of pipe actually installed at the unit price stated on the Bid Form. Payment shall include compensation for furnishing and placing all materials, equipment, labor, testing, video inspection, and incidentals necessary to complete the Work. All pipe except service laterals will be measured horizontally from center-to-center of manholes, to ends of pipe, or to center of cleanout wye whichever is applicable. No deduction will be made for fittings or structures.

B. Existing Manhole Connections. Measurement and payment for Connections to Existing Manholes will be at the unit price stated in the Bid Form. If no items are shown in the Bid Form, connections to existing manholes will be considered incidental or covered in other unit prices and no separate measurement and payment will occur.

END OF SECTION
SECTION 33 4113
STORM DRAIN PIPE AND FITTINGS

PART 1 GENERAL

1.01 SUMMARY
A. This item shall include furnishing and installing the storm drain, perimeter footing drain, roof drain, retaining wall drain piping, and fittings as identified on the Drawings.
B. The Contractor shall provide manufacturer's certifications, including test results for all piping, fittings and appurtenances supplied. All submittals shall be in conformance with the requirements of Section 01-3000 – Administrative Requirements.
C. All work shall conform to the latest version of the Oregon Standard Specifications (OSS) Part 00400, except as specified herein and shown on the Plans.

1.02 RELATED REQUIREMENTS
A. Section 31 2316 - Excavation: Excavating of trenches.
B. Section 31 2316.13 - Trenching: Excavating, bedding, and backfilling.
C. Section 31 2323 - Fill: Bedding and backfilling.
D. Section 33 0513 - Manholes and Structures.
E. Section 33-4400 - Storm Drain Structures and Appurtenances

1.03 REFERENCE STANDARDS
A. Use current adopted addition(s).

PART 2 PRODUCTS

2.01 PIPE MATERIALS
A. All pipe, fittings and appurtenances shall be new and unused.
B. PVC Storm Drain Pipe (4" through 15")
   1. Storm drain pipe shall be PVC meeting the requirements of ASTM D3034, SDR 35, AWWA C900, or AWWA C905.
   2. Pipe compound shall meet ASTM D1784 Cell Class 12454 or 12364.
   3. Pipe shall be formed with integral bell joints meeting ASTM D3212 with rubber gaskets meeting ASTM F477.
   4. PVC fittings shall be provided as required including tee-wyes, wyes, elbows, caps, plugs, couplings, etc. Fittings shall be as manufactured by the pipe manufacturer or as approved by the pipe manufacturer. Fittings shall have same gasketed bell and spigot design as the pipe.
   5. Pipe and fittings shall be Ring-Tite PVC Gravity Sewer Pipe and Fittings as manufactured by JM Eagle; or approved equal.
   6. Locations: Roof Drain Piping and other locations shown on Drawings.

2.02 MISCELLANEOUS MATERIALS
A. Concrete shall conform to Oregon Standard Specifications Section 00440, Commercial Grade Concrete. Compressive field strength shall not be less than 3,000 psi at 28 days. Maximum aggregate size shall be 1½-inches. Slump shall be between 2 and 4 inches.
B. Non-Shrink Grout. Grout shall be Sika 212, Euco N-S, Five Star, or approved equal nonmetallic cementitious commercial grout exhibiting zero shrinkage per ASTM C827. Grout shall not be amended with cement or sand and shall not be reconditioned with water after initial mixing. Nonshrink grout shall be placed and packed only with the use of an approved commercial bonding agent. Unused grout shall be discarded after 20 minutes.
C. Tracer Wire. Provide detectable tracer wire along all non-metallic water pipes.
   1. Tracer wire shall be 12 AWG minimum, solid copper.
   2. Insulation for tracer wire shall be 0.045-inch thick HDPE designed for direct bury.
PART 3 EXECUTION

3.01 PIPE INSTALLATION

A. All pipe and fittings shall be installed in accordance with the manufacturer's recommendations and APWA standards.

B. Comply with Sections on Trenching, Shoring and Dewatering.

C. Lay pipe to slope gradients noted on Drawings; with maximum variation from true slope of 1/8 inch in 10 feet.

D. Install pipe couplings.

E. Place aggregate in maximum 6-inch lifts, consolidating each lift.

F. Refer to Section 31-2323 - Fill for compaction requirements. Do not displace or damage pipe when compacting.

3.02 DEFLECTION TESTING FOR PVC STORM DRAIN PIPE

A. In addition to hydrostatic testing, the contractor shall conduct deflection tests of main line storm sewers constructed of PVC or HDPE pipe. Testing will consist of pulling an approved mandrel through the completed pipeline after backfill and compaction to finish grade is complete. Testing shall be conducted in the presence of the Engineer.

B. Diameter of the mandrel shall be at least 95% of the pipe internal diameter. Mandrel shall have at least 6 vanes.

C. Testing shall be done from manhole to manhole. Pipe shall be thoroughly cleaned and flushed prior to pulling the mandrel. Mandrel shall pass smoothly through the pipe without excessive effort.

D. Testing shall be conducted only after at least 30 days have elapsed after backfill and compaction was completed.

PART 4 PAYMENT AND PAYMENT

4.01 Storm drain pipe and fittings. Measurement and payment for storm drain pipe installation will be made on a linear foot basis for the size of pipe actually installed at the unit price stated on the Bid Form. Payment shall include compensation for furnishing and placing all materials, equipment, labor, testing, video inspection, and incidentals necessary to complete the Work. All pipe except service laterals will be measured horizontally from center-to-center of manholes, to ends of pipe, or to center of cleanout wye whichever is applicable. No deduction will be made for fittings or structures.

END OF SECTION
SECTION 33-4400
STORM DRAIN STRUCTURES AND APPURtenANCES

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Catch Basins.
B. Field Drains.
C. Cleanout(s) - Roof and Storm.

1.02 RELATED REQUIREMENTS
A. Section 01-5713 - Temporary Erosion and Sedimentation Control
B. Section 33-0513 - Manholes and Structures
C. Section 33-4113 - Storm Drain Pipe and Fittings

1.03 REFERENCE STANDARDS
A. Use current adopted addition(s).

1.04 SUBMITTALS
A. See Section 01-3300 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide submittal data for all items in this Section as required to determine compliance.

PART 2 PRODUCTS
2.01 CONCRETE CATCH BASINS
A. Precast concrete catch basins with cast iron or steel grate as indicated on the Drawings.
B. Catch basins shall be ODOT Type G-2 with Type 2 grate as detailed in OSS Drawing No. RD 364.
C. Swale outlet basin shall be ODOT Type D with Type-2 grate as detailed in OSS Drawing No. RD 370.
D. Frames and grates shall be tested for tight fit without rocking. Maximum amount of rocking deviation allowed shall be 1/16”.
E. Mortar shall conform to ASTM C387 and shall be mixed to a consistency that will provide good adhesion to precast concrete.
F. Concrete shall conform to ASTM C94 utilizing Type II Portland Cement. Compressive strength shall not be less than 3000 psi at 28 days.
G. HDPE oil/debris shall be manufactured by Rhino USA of Oregon or approved equivalent.

2.02 FIELD DRAINS
A. Materials:
   1. Field Drains shall be prefabricated and manufactured from PVC pipe stock utilizing a thermo-molding process that meets or exceeds the pressure requirements of the ASTM D3212 standard for connections joining drainage pipes utilizing flexible elastomeric seals conforming to ASTM F477 to ensure consistent watertight seal throughout the structure body and the outlet stubs. The raw material used to manufacture this PVC pipe stock shall conform to ASTM D1784 cell class 12454. PVC Field Drains shall be abrasion and corrosion resistant. The Field Drains may require adapting to multiple pipe types and diameters, changes in direction and elevation, as shown on the Plans.
   2. Field Drain grates and frame assemblies shall be constructed of ductile iron and load rated H10 for pedestrian and medium-duty loads.
   3. Field Drains shall be as manufactured by Harco, Nyloplast/ADS, or approved equal.
2.03 CLEANOUT(S) - ROOF AND STORM

A. Materials:
   1. Cleanouts (Roof Drain Cleanouts and Storm Drain Cleanouts) shall be constructed from PVC pipe and fittings meeting the requirements of Section 33-4113 – Storm Drain Pipe and Fittings.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Verify that finish grade elevations are set properly for catch basin lids and other such items.

B. Field Drains: Verification of Conditions: Verify that finish grade elevations are set properly for field basin grates.

C. Cleanouts: Verification of Conditions: Verify that finish grade elevations are set properly for cleanouts.

3.02 PREPARATION

A. Prepare and compact subgrade in accordance with applicable Sections on Trenching and Excavation.

B. Install Aggregate Base under structures as indicated on the Drawings or 6-inch minimum compacted thickness if not shown in Drawings.

3.03 INSTALLATION

A. Install in accordance with manufacturer’s instructions and the project Drawings.

B. Catch Basin Installation
   1. Prepare native soil and place and compact the crushed rock base to 95% maximum dry density. Place Foundation Stabilization if required. Backfill material around basins shall be the same as specified for the connecting pipes.
   2. Aggregate base shall be carefully placed on the prepared soil so as to be fully and uniformly supported at true grade and alignment.
   3. Pipe penetrations shall be pre-cast or core drilled to the appropriate size for each pipe entering or exiting the catch basin. Jackhammering will not be allowed. Pipe penetrations shall include a grout ring and shall be grouted water tight.
   4. Install transition couplings within 2 feet of the outside wall of catch basins on all pipes; or, a pipe bell shall be located a minimum of 1 foot to a maximum of 2 feet from the outside wall.
   5. Frame and covers shall be installed so that the cover is exposed and flush with the existing surface or finish grade elevation. Catch Basins shall be located and the area graded to drain properly into the catch basins.
   6. Catch basin installations with tilted or otherwise defective bases, wall sections which are not plumb, covers which do not match existing grade properly, or are otherwise not in specification compliance shall be removed by the Contractor and replaced until acceptable.
   7. Refer and comply with any applicable detail drawings for Catch Basins in the Drawings.

C. Field Drain Installation
   1. Excavate to width and depth required for Field Drain being installed as per the requirements of Section 31-2316 - Excavating.
   2. Comply with Sections on Trenching, Shoring and Dewatering.
   3. Level and compact bedding as required to support drain basin and pipes.
   4. Set Field Drain in place and level prior to pipe installation. Backfill so basin is stable during pipe install.
   5. Place backfill material under and around pipe and drain basin outlets in lifts and compact following Section 31-2323 - Fill.
6. Adjust height of the grate or cover to finish grade elevation. Use riser sections as required to raise to finish elevation.

D. Cleanouts Installation
   1. Install in accordance with manufacturer’s instructions and the Plans.
   2. Excavate to width and depth required for Cleanout being installed as per the requirements of Section 31-2316 – Excavating.
   3. Comply with Sections on Trenching, Shoring, and Dewatering.
   4. Level and compact bedding as required to support drain basin and pipes.
   5. Set Cleanout components in place and level prior to pipe installation.
   6. Place backfill material under and around pipe and fittings in lifts and compact following Section 31-2323 - Fill.
   7. Adjust height of the cover to finish grade elevation.

PART 4 PAYMENT
4.01 MEASUREMENT AND PAYMENT
   A. Payment for Catch Basins will be made on a unit price basis per each, at the price stated in the Bid Form for each different type and/or size where applicable. Payment will include all materials, labor, and equipment required for complete installation, including excavation and backfill around catch basins, all precast components, pipe adapters, testing, temporary hard surfacing, and all else related to this item not paid under other sections.

END OF SECTION
SECTION 34-4113.10
METAL SIGN SUPPORTS

PART 1 - GENERAL
1.01 SECTION INCLUDES
A. Furnishing all labor, materials, equipment and performing all work specified herein for erecting metal sign supports for new and/or relocated existing signs.

1.02 RELATED SECTIONS
A. Section 34-4113.20 - Signs.
B. Section 32-1313 - Concrete Paving.

1.03 RELATED REFERENCES
   1. 00930 Metal Sign Supports
   2. 00940 Signs
   3. 02910 Sign Materials

1.04 QUALITY ASSURANCE

1.05 SUBMITTALS
A. See Section 01-3000 Administrative Requirements.

PART 2 - PRODUCTS
2.01 PERFORATED STEEL SQUARE TUBE SIGN SUPPORTS
A. 2" x 2" Square Sign Posts.
B. 2.25" x 2.25" x 0.105", 12 gauge, galvanized steel finish. Holes at 1-inch on center, on all four sides.

PART 3 - EXECUTION
3.01 GENERAL
A. Conform to ODOT/APWA, Section 00930 of the Standard Specifications for Construction, 2018 Edition

PART 4 PAYMENT
4.01 MEASUREMENT AND PAYMENT
A. Payment for Metal Sign Supports will be made on a Lump Sum basis as stated in the Bid Form.

END OF SECTION
SECTION 34-4113.20

SIGNS

PART 1 - GENERAL

1.01 SECTION INCLUDES
   A. Furnish all labor, materials, equipment and performing all work specified herein for furnishing, fabricating and erecting traffic signs of the types shown.

1.02 RELATED SECTIONS
   A. Section 34-4113.10 - Metal Sign Supports

1.03 RELATED REFERENCES
      1. 00930 - Metal Sign Supports
      2. 00940 - Signs
      3. 02910 - Sign Materials

1.04 TYPE OF SIGNS
   A. ADA Parking R7-8, two (2) each required.
      1. White, retroreflective sheeting (background).
      2. Green, retroreflective sheeting (legend).
      3. White on blue, retroreflective sheeting (symbol).
      5. Size: 12" X 18", handicap reserved parking.
   B. Van Accessible R7-8B, one (1) each required.
      1. White, retroreflective sheeting (background).
      2. Green, retroreflective sheeting (legend).
   B. Stop R1-1, one (1) each required.
      1. Red, retroreflective sheeting (background).
      2. White, retroreflective sheeting (legend).
      4. Size: 30" X 30".

1.05 QUALITY ASSURANCES

1.06 SUBMITTALS
   A. See Section 01-3000 Administrative Requirements.

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.01 GENERAL

PART 4 - PAYMENT

4.01 MEASUREMENT AND PAYMENT
   A. Payment for Signs will be made on a Lump Sum basis as stated in the Bid Form.

END OF SECTION