

**SECTION 00 01 01
PROJECT TITLE PAGE
PORT OF TACOMA
TACOMA, WASHINGTON
PARCEL 77 AUTO IMPORT TERMINAL**

**PROJECT NO. 201020.01
CONTRACT NO. 070770**

**Jane Vandenberg, PE
Director, Engineering**

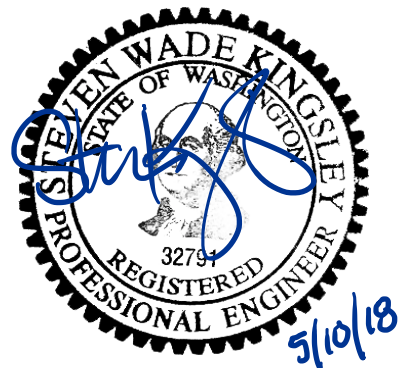
**Carol Rhodes, PE
Senior Project Manager**

END OF PROJECT TITLE PAGE

PORT OF TACOMA PARCEL 77 AUTO IMPORT TERMINAL

The undersigned Engineer of Record hereby certifies that the Technical Specifications for the following portions of this project for the Bid Submittal of the Port of Tacoma Parcel 77 Auto Import Terminal were written by me, or under my direct supervision, and that I am duly registered under the laws of the State of Washington, and hereby affix my Professional Seal and signature. Those sections prepared under my direct supervision and being certified by my seal and signature below are as follows:

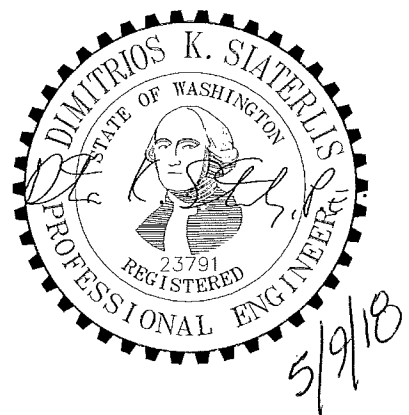
- 02 41 13 – Selective Site Demolition
- 03 11 00 – Concrete Forming
- 03 20 00 – Concrete Reinforcing
- 03 30 00 – Cast in Place Concrete
- 31 00 00 – Earthwork
- 31 23 19 - Dewatering
- 31 23 33 – Trenching and Backfilling
- 31 41 00 – Shoring and Underpinning
- 32 11 23 – Crushed Surfacing
- 32 12 16 – Asphalt Paving
- 32 17 23 – Pavement Markings and Signing
- 32 31 13 – Chain Link Fence and Gates
- 33 10 00 – Water Utilities
- 33 30 00 – Sanitary Sewer Utilities
- 33 32 13 – Sewage Lift Station
- 33 40 00 – Storm Drainage Utilities
- 33 40 19 – Bioretention Systems
- 33 44 19 – Stormwater Treatment
- 33 44 19.19 – Utility Oil Water Separators



PORT OF TACOMA PARCEL 77 AUTO IMPORT TERMINAL

The undersigned Engineer of Record hereby certifies that the Technical Specifications for the following portions of this project for the Bid Submittal of the Port of Tacoma Parcel 77 Auto Import Terminal were written by me, or under my direct supervision, and that I am duly registered under the laws of the State of Washington, and hereby affix my Professional Seal and signature. Those sections prepared under my direct supervision and being certified by my seal and signature below are as follows:

- 26 05 00 – General Electrical Provisions
- 26 05 01 – Basic Materials and Methods
- 26 05 02 - Testing
- 26 05 17 – Mini Power Zones
- 26 05 19 – Wire and Cables, Secondary Voltages
- 26 05 26 - Grounding
- 26 05 33 - Raceways
- 26 05 43 – Underground Ducts and Handholes
- 26 05 48 – Seismic Controls for Electrical Work
- 26 05 73 – Overcurrent Protective Device Coordination Study
- 26 09 23 – Lighting Controls
- 26 24 13 - Switchboards
- 26 24 16 - Panelboards
- 26 27 13 – Electrical Service and Metering
- 26 27 26 – Wiring Devices and Plates
- 26 28 16 – Disconnects and Fused Switches
- 26 56 00 – Exterior Lighting



PROCUREMENT AND CONTRACTING REQUIREMENTS

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- 00 01 15 - List of Drawing Sheets
- 00 11 13 - Advertisement for Bids
- 00 21 00 - Instructions to Bidders
- 00 26 00 - Substitution Procedures During Bidding
- 00 31 00 - Available Project Information
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- 00 43 25 - Substitution Request Form During Bidding
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- 00 72 00 - General Conditions
- 00 73 16 - Insurance Requirements
- 00 73 46 - Washington State Prevailing Wage Rates
- 00 73 63 - Security Requirements

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- 01 31 23 - Web Based Construction Management
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APPENDICES

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Appendix C – Materials Management Plan
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Appendix E – Permits

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END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

A. Contract Drawings: The following drawings are a part of the Contract Documents:

Sheet No.	Drawing Title
1	G1.0 COVER
2	G1.1 SHEET INDEX
3	G1.2 SHEET INDEX
4	G1.3 SITE PLAN
5	G1.4 CONSTRAINTS AND SEQUENCING PLAN
6	G1.5 GENERAL NOTES
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9	V1.1 TOPOGRAPHIC SURVEY AREA 1
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11	V1.3 TOPOGRAPHIC SURVEY AREA 3
12	V1.4 TOPOGRAPHIC SURVEY AREA 4
13	V1.5 TOPOGRAPHIC SURVEY AREA 5
14	V1.6 TOPOGRAPHIC SURVEY AREA 6
15	V1.7 TOPOGRAPHIC SURVEY AREA 7
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17	V1.9 TOPOGRAPHIC SURVEY AREA 9
18	V2.0 SURVEY NOTES
19	D1.0 TESC, DEMOLITION, AND REMEDIATION PLAN AREA 1
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21	D1.2 TESC, DEMOLITION, AND REMEDIATION PLAN AREA 3
22	D1.3 TESC, DEMOLITION, AND REMEDIATION PLAN AREA 4
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26	D1.7 DEMOLITION AND TESC NOTES
27	D1.8 EROSION CONTROL DETAILS
28	D1.9 BUILDING DEMOLITION ELEVATIONS
29	D1.10 BUILDING DEMOLITION ELEVATIONS
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31	C1.1 SITE PLAN AREA 2
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33	C1.3 SITE PLAN AREA 4
34	C1.4 SITE PLAN AREA 5
35	C1.5 SITE PLAN AREA 6
36	C1.6 SITE NOTES
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38	C1.8 SITE DETAILS
39	C1.9 SITE DETAILS
40	C1.10 SITE DETAILS
41	C1.11 SITE DETAILS

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43	C1.13 NORTH DRIVEWAY SITE PLAN
44	C1.14 SOUTH DRIVEWAY SITE PLAN
45	C1.15 SITE DETAILS
46	C1.16 SITE DETAILS
47	C1.17 SITE DETAILS
48	C1.18 SITE DETAILS
49	C1.19 SITE DETAILS
50	C2.0 GRADING & DRAINAGE PLAN AREA 1
51	C2.1 GRADING & DRAINAGE PLAN AREA 2
52	C2.2 GRADING & DRAINAGE PLAN AREA 3
53	C2.3 GRADING & DRAINAGE PLAN AREA 4
54	C2.4 GRADING & DRAINAGE PLAN AREA 5
55	C2.5 GRADING & DRAINAGE PLAN AREA 6
56	C2.6 GRADING AND DRAINAGE LOCATION SCHEDULE AND NOTES
57	C2.7 SITE SECTIONS
58	C2.8 SITE SECTIONS
59	C2.9 STORM DRAINAGE PROFILES
60	C2.10 STORM DRAINAGE PROFILES
61	C2.11 STORM DRAINAGE PROFILES
62	C2.12 STORM DRAINAGE PROFILES
63	C2.13 STORM DRAINAGE PROFILES
64	C2.14 STORM DRAINAGE PROFILES
65	C2.15 STORM DRAINAGE PROFILES
66	C2.16 STORM DRAINAGE PROFILES
67	C2.17 STORM DRAINAGE PROFILES
68	C2.18 STORM DRAINAGE PROFILES
69	C2.19 STORM DRAINAGE PROFILES
70	C2.20 STORM DRAINAGE PROFILES
71	C2.21 STORM DRAINAGE PROFILES
72	C2.22 STORMWATER TREATMENT VAULT DETAILS
73	C2.23 STORMWATER TREATMENT VAULT DETAILS
74	C2.24 STORMFILTER DETAILS
75	C2.25 STORM DRAINAGE DETAILS
76	C2.26 STORM DRAINAGE DETAILS
77	C2.27 STORM DRAINAGE DETAILS
78	C2.28 BIORETENTION PLAN
79	C2.29 BIORETENTION PLANTING PLAN
80	C2.30 BLAIR WATERWAY OUTFALL PLAN
81	C2.31 SOUTH DRIVEWAY DRAINAGE PLAN
82	C2.32 NORTH DRIVE GRADING AND DRAINAGE PLAN
83	C2.33 BLAIR OUTFALL PROFILE AND SECTIONS
84	C2.34 BLAIR OUTFALL DETAILS
85	C3.0 PAVING PLAN AREA 1
86	C3.1 PAVING PLAN AREA 2
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DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS
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99	U1.5 UTILITY PLANS AREA 6
100	U1.6 UTILITY LOCATION SCHEDULE
101	U1.7 UTILITY PROFILES
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103	U1.9 UTILITY PROFILES
104	U1.10 UTILITY PROFILES
105	U1.11 UTILITY PROFILES
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116	U1.22 UTILITY LOCATION PLAN AREA 5
117	U1.23 UTILITY LOCATION PLAN AREA 6
118	U1.24 UTILITY ELECTRICAL SCHEDULE
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120	E1.1 ELECTRICAL 13.8KV POWER DISTRIBUTION PLAN
121	E1.2 ELECTRICAL LOW VOLTAGE POWER DISTRIBUTION PLAN AREA 1
122	E1.3 ELECTRICAL LOW VOLTAGE POWER DISTRIBUTION PLAN AREA 2
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124	E1.5 ELECTRICAL LOW VOLTAGE POWER DISTRIBUTION PLAN AREA 4
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129	E1.10 ELECTRICAL DATA DISTRIBUTION PLAN AREA 1
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DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS
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132	E1.13 ELECTRICAL DATA DISTRIBUTION PLAN AREA 4
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134	E1.15 ELECTRICAL DATA DISTRIBUTION PLAN AREA 6
135	E1.16 ELECTRICAL ONE LINE DIAGRAM
136	E1.17 ELECTRICAL DETAILS – SERVICE POINTS
137	E1.18 ELECTRICAL DETAILS – INSTALLATION DETAILS
138	E1.19 ELECTRICAL DETAILS – LIGHTING CONTROLS
139	E1.20 ELECTRICAL LIGHTING DETAILS – LIGHT POLES
140	E1.21 ELECTRICAL LIGHTING DETAILS – LIGHTING CONTROLS
141	E1.22 ELECTRICAL PANEL SCHEDULES
142	E1.23 ELECTRICAL CONDUIT/CABLE, AND FIXTURES SCHEDULES
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144	L1.0 LANDSCAPE PLAN AREA 1
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150	L1.6 ENLARGED PLAN AREA 2
151	L1.7 ENLARGED PLAN AREA 2
152	L1.8 ENLARGED PLAN AREA 2
153	L1.9 ENLARGED PLAN AREA 3
154	L1.10 ENLARGED PLAN AREA 3
155	L1.11 LANDSCAPE NOTES AND DETAILS
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157	L2.1 IRRIGATION PLAN AREA 3
158	L2.2 ENLARGED IRRIGATION PLAN AREA 2
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160	L2.4 ENLARGED IRRIGATION PLAN AREA 2
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162	L2.6 ENLARGED IRRIGATION PLAN AREA 3
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PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF LIST OF DRAWINGS

**THE PORT OF TACOMA IS CURRENTLY ACCEPTING SEALED BIDS FOR CONSTRUCTION OF
THE FOLLOWING:**

PARCEL 77 AUTO IMPORT TERMINAL

PROJECT NO. 201020.01 | CONTRACT NO. 070770

- Scope of Work:** The work required for this project includes: building demolition, demolition, grading, paving, striping, stormwater infrastructure, bioretention ponds, outfall, water and sewer utilities, electrical, lighting, fencing, curb and sidewalk and landscaping.
- Bid Estimate:** Estimated cost range is \$18,320,000 to \$19,280,000, plus Washington State Sales Tax (WSST).
- Sealed Bid Date/Time/ Location:** Bids will be received at the Front Reception Desk, Port Administration Office, One Sitcum Plaza, Tacoma, Washington until **2:00 P.M. on June 13, 2018**, at which time they will be publicly opened and read aloud.
- Pre-bid Conference and Site Tour:** A pre-bid conference and site visit have been set for 5/23/18 at 1:00 PM. The site visit will convene at the Port's Administrative building, located at One Sitcum Plaza. The following Personal Protective Equipment is required for the site visit: sturdy shoes, reflective vest, gloves, safety glasses, hearing protection, and hardhat.
- Bidding Security:** Each bid must be accompanied by a Certified Check or Bid Security Bond in an amount equal to five (5) percent of the bid.
- Contact Information:** All questions are to be put into writing to the Port at procurement@portoftacoma.com. No oral answers will be binding by the Port.

**Bidding
Documents:**

Plans, Specifications, Addenda, and Plan Holders List for this project are available on-line through The Port of Tacoma's Website www.portoftacoma.com. Click on "Contracts"; "Procurement", and then the Procurement Number 070770. Bidders must subscribe to the Holder's List on the right hand side of the screen in order to receive automatic email notification of future addenda and to be placed on the Holder's List.

Contact procurement@portoftacoma.com with questions. Holder's Lists will be updated regularly. Additional Instructions available in 00 21 00 - Instructions to Bidders.

END OF SECTION

PART 1 - SUMMARY

1.01 DEFINITIONS

All definitions set forth in the Agreement, the General Conditions of the Contract for Construction and in other Contract Documents are applicable to the Bidding Documents.

- A. "Addenda" are written or graphic instruments issued prior to the execution of the Contract which modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections. The contents of an Addendum are issued in no particular order and therefore should be carefully and completely reviewed.
- B. An "Additive Bid" (or "Additive") is an amount stated in the Bid to add specified features of the work.
- C. An "Alternate Bid" (or "Alternate") is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.
- D. "Award" means the formal decision by the Port of Tacoma ("Port") notifying a Responsible Bidder with the lowest responsive Bid of the Port's acceptance of the Bid and intent to enter into a Contract with the Bidder.
- E. The "Award Requirements" include the statutory requirements as a condition precedent to Award.
- F. The "Base Bid" is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base to which work may be added or from which work may be deleted for sums stated in Alternate Bids.
- G. A "Bid" is a complete and properly signed proposal to do the Work, submitted in accordance with the Bidding Documents, for the sums therein stipulated and supported by any data called for by the Bidding Documents.
- H. The "Bid Date" is the day and hour specified in the Bidding Documents, as may be changed through an Addendum, by which Bidders are required to submit Bids to the Port.
- I. The "Bid Form" is the form(s) included with the Bidding Documents, with Specification Section 00 41 00, through which a Bidder submits a Bid.
- J. A "Bidder" is a person or entity who submits a Bid.
- K. The "Bidding Documents" include the Advertisement or Invitation to Bid, Instructions to Bidders, the Bid Form, any other sample bidding and contract forms, the Bid Bond, and the proposed Contract Documents, including any Addenda issued prior to the Bid Date.
- L. The "Contract Documents" proposed for the Work consist of the Agreement, the General Conditions of the Contract (as well as any Supplemental, Special or other Conditions included in the project manual), the Drawings, the Specifications, and all Addenda issued prior to, and all modifications issued after, execution of the Contract.
- M. The "Schedule of Unit Prices" is a separate schedule on the Bid Form for Unit Pricing as an all-inclusive price per unit of measurement for materials, equipment or services as described in the Bidding Documents or in the proposed Contract Documents for the optional use of the Port. Quantities are not predictions of amounts anticipated. The Port may but is not obligated to accept a Schedule of Unit Price if it accepts the Base Bid. The Schedule of Unit Prices are not factored into the evaluation of determining the low bid amount and are not included as part of the bid award amount.

- N. A "Sub-Bidder" is a person or entity of any tier who submits a bid or proposal to or through the Bidder for materials, equipment or labor for a portion of the Work.

1.02 BIDDER'S REPRESENTATIONS

By making its Bid, each Bidder represents that:

- A. **BIDDING DOCUMENTS.** The Bidder has read and understands the Bidding Documents, and its Bid is made in accordance with them.
- B. **PRE-BID MEETING.** The Bidder has attended pre-Bid meeting(s) required by the Bidding Documents. Attendance at a mandatory meeting or training session means that, in the sole opinion of the Port, a Project representative of a prospective Bidder has attended all or substantially all of such meeting or session.
- C. **BASIS.** Its Bid is based upon the materials, systems, services, and equipment required by the Bidding Documents, and is made without exception.
- D. **EXAMINATION.** The Bidder has carefully examined and understands the Bidding Documents, the Contract Documents (including, but not limited to, any liquidated damages and insurance provisions), and the Project site, including any existing buildings, it has familiarized itself with the local conditions under which the Work is to be performed and has correlated its observations with the requirements of the proposed Contract Documents and it has satisfied itself as to the nature, location, character, quality and quantity of the Work, the labor, materials, equipment, goods, supplies, work, services and other items to be furnished, and all other requirements of the Contract Documents. The Bidder has also satisfied itself as to the conditions and other matters that may be encountered at the Project site or affect performance of the Work or the cost or difficulty thereof, including but not limited to those conditions and matters affecting: transportation, access, disposal, handling and storage of materials, equipment and other items; availability and quality of labor, water, electric power and utilities; availability and condition of roads; climatic conditions and seasons; physical conditions at the Project site and the surrounding locality; topography and ground surface conditions; and equipment and facilities needed preliminary to and at all times during the performance of the Work. The failure of the Bidder fully to acquaint itself with any applicable condition or matter shall not in any way relieve the Bidder from the responsibility for performing the Work in accordance with, and for the Contract Sum and within the Contract Time provided for in, the Contract Documents.
- E. **PROJECT MANUAL.** The Bidder has checked its copies of the project manual (if any) with the table of contents bound therein to ensure the project manual is complete.
- F. **SEPARATE WORK.** The Bidder has examined and coordinated all Drawings, Contract Documents, and Specifications with any other contracts to be awarded separately from, but in connection with, the Work being Bid upon, so that the Bidder is fully informed as to conditions affecting the Work under the Contract being Bid upon.
- G. **LICENSE REQUIREMENTS.** Bidders and Sub-Bidders shall be registered and shall hold such licenses as may be required by the laws of Washington, including a certificate of registration in compliance with RCW 18.27, for the performance of the Work specified in the Contract Documents.
- H. **NO EXCEPTIONS.** Bids must be based upon the materials, systems and equipment described and required by the Bidding Documents, without exception.

1.03 BIDDING DOCUMENTS

- A. **COPIES**

1. Bidders may obtain complete sets of the Bidding Documents from The Port of Tacoma's Website www.portoftacoma.com. Click on "Contracts" then "Procurement".
2. Complete Sets. Bidders shall use complete sets of Bidding Documents in preparing Bids and are solely responsible for obtaining updated information. The Port does not assume any responsibility for errors or misinterpretations resulting from the use of incomplete and/or superseded sets of Bidding Documents.
3. Conditions. The Port makes copies of the Bidding Documents available only for the purpose of obtaining Bids on the Work and does not confer a license or grant permission for any other use.
4. Legible Documents. To the extent any Drawings, Specifications, or other Bidding Documents are not legible, it is the Bidder's responsibility to obtain legible documents.

B. INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

1. Format. The Contract Documents are divided into parts, divisions, and sections for convenient organization and reference. Generally, there has been no attempt to divide the Specification sections into Work performed by the various building trades, any Work by separate contractors, or any Work required for separate facilities in or phases of the Project.
2. Duty to Notify. Bidders shall promptly notify the Port in writing of any ambiguity, inconsistency, or error that they may discover upon examination of the Bidding Documents or of the site and local conditions.
3. Products and Installation. All Bidders shall thoroughly familiarize themselves with specified products and installation procedures and submit to the Port any objections (in writing) no later than seven (7) days prior to the Bid Date. The submittal of the Bid constitutes acceptance of products and procedures specified as sufficient, adequate, and satisfactory for completion of the Contract.
4. Written Request. Bidders requiring clarification or interpretation of the Bidding Documents shall make a written email request to procurement@portoftacoma.com at least seven (7) days prior to the Bid Date.
5. **Request to Modify Responsibility Criteria.** No later than seven (7) days prior to the Bid Date, a potential Bidder may request in writing that the Port modify the Responsibility Criteria. The Port will evaluate the information submitted by the potential Bidder and respond before the Bid Date. If the evaluation results in a change of the Criteria, the Port will issue an Addendum identifying the new Criteria.
6. Addenda. The Bidder shall not rely on oral information provided at any pre-Bid meetings or during site visits. Verbal statements made by representatives of the Port are for informational purposes only. Any interpretation, correction or change of the Bidding Documents will be made solely by written Addendum. Interpretations, corrections or changes of the Bidding Documents made in any manner other than by written Addendum, including but not limited to oral statements, will not be binding, and Bidders shall not rely upon such statements, interpretations, corrections or changes. The Port is not responsible for explanations or interpretations of the Bidding Documents other than in a written Addendum.
7. Site Visits. Any site visits are provided as a courtesy to potential Bidders to assist them in becoming familiar with the Project site conditions. However, only the Bidding Documents, including any issued Addenda, may be relied upon by Bidders.

8. Singular References. Reference in the singular to an article, device, or piece of equipment shall include as many of such articles, devices, or pieces as are indicated in the Contract Documents or as are required to complete the installation.
9. Utilities and Runs. The Bidder should assume that the exact locations of any underground or hidden utilities, underground fuel tanks, and plumbing and electrical runs may be somewhat different from any location indicated in the surveys or Contract Documents.

C. SUBSTITUTIONS

1. For substitutions during bidding, refer to Section 00 26 00 – Substitution Procedures During Bidding.

D. ADDENDA

1. Distribution. All Addenda will be written and will be made available on the Port's website or any other source specified by the Port for the Project.
2. Copies. Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.
3. Verification and Acknowledgment of Receipt. Prior to submitting a Bid, each Bidder shall ascertain that it has received all Addenda issued. Each Bidder shall acknowledge its receipt and consideration of all Addenda in its Bid.

1.04 BIDDING PROCEDURE

A. FORM AND STYLE OF BIDS

1. Form. Bids (including required attachments) shall be submitted on forms identical to the Bid Form included with the Bidding Documents. No oral, email, or telephonic responses or modifications will be considered.
2. Entries on the Bid Form. All blanks on the Bid Form shall be filled in by typewriter, printer, or manually in ink.
3. Figures. All sums shall be expressed in figures, not words. Portions of the Bid Form may require the addition or multiplication of components bids to a total or the identification of component amounts within a total. In case of discrepancy between unit prices listed and their sum(s), the unit prices listed shall govern (rather than the sum).
4. Initial Changes. Any interlineation, alteration or erasure shall be initialed by an authorized representative of the Bidder.
5. Bid Breakdown. The Bid Form may contain, for the Port's accounting purposes only, a breakdown of some or all of the components included in the Base Bid.
 - a. For lump sum bids the total Contract Sum shall be submitted.
 - b. For unit price bids a price shall be submitted for each item of the Work, an extension thereof, and, if requested, the total Contract Sum.
6. Alternates. All Alternates should be Bid. The Port reserves the right, but is not obligated, to reject any Bid on which all requested Alternates are not Bid. If no change in the Base Bid is required for an Alternate, enter "Zero" or "0." If there is no entry, the Bidder will be presumed to have made no offer to perform the Alternate. If it is not otherwise clear from the Bid or the nature of the Alternate, it will be presumed that the amount listed for an Alternate is additive rather than deductive.

7. Schedule of Unit Prices. All Unit Prices under this schedule shall be bid. The Port reserves the right, but is not obligated to, reject any Bid on which all requested Schedule of Unit Prices are not bid.
8. No Conditions. The Bidder shall make no conditions or stipulations on the Bid Form nor qualify its Bid in any manner.
9. Identity of Bidder. The Bidder shall include in the specified location on the Bid Form the legal name of the Bidder and, if requested, a description of the Bidder as a sole proprietor, a partnership, a joint venture, a corporation, or another described form of legal entity. The Bid shall be signed by the person or persons legally authorized to bind the Bidder to a contract. The Port verifies signature authority on the Labor and Industries website <https://fortress.wa.gov/lni/bbip/Search.aspx> under the contractor registration business owner information. If the business owner information is not current the bidder shall show proof of authority to sign at the request of the Port. A Bid submitted by an agent shall have a current power of attorney attached certifying the agent's authority to bind the Bidder
10. Bid Amounts Do Not Include Sales Tax. The Work to be performed constitutes a "retail sale" as this term is defined in RCW 82.04.050. Thus, the Base Bid amount shall include in the sum stated all taxes imposed by law, EXCEPT WASHINGTON STATE AND LOCAL SALES TAX. The engaged Contractor will pay retail sales tax on all consumables used during the performance of the Work and on all items that are not incorporated into the final Work; this tax shall be included in the Base Bid price and in any other prices set forth on the Bid Form. The Port will pay state and local retail sales tax on each progress payment and final payment to the engaged Contractor for transmittal by the Contractor to the Washington State Department of Revenue or to the applicable local government.

B. POTENTIAL LISTING OF SUB-BIDDERS (SUBCONTRACTORS)

1. Procedure. On certain projects of the Port, the Bid Form includes a requirement that certain Sub-Bidders be listed, in which case the Bidder must complete the required list. In these circumstances, and regardless of the anticipated cost of the Project, the Bidder must name the Sub-Bidder or Sub-Bidders with whom the Bidder, if Awarded the Contract, will subcontract directly (i.e., not lower-tier Sub-Bidders) for performance of the Work of:
 - a. HVAC (heating, ventilation and air conditioning) Work,
 - b. plumbing Work as described in RCW 18.106,
 - c. electrical Work as described in RCW 19.28, and
 - d. any other categories of Work listed on the Sub-Bidder listing form and/or Bid Form.
2. Self-Performance: If the Bidder intends to self-perform any of these categories of Work, it must name itself for each such category of Work.
3. Multiple Entries: The Bidder shall not list more than one (1) entity for a particular category of Work identified, unless a Sub-Bidder will vary based on an Alternate Bid, in which case the Bidder shall identify the Sub-Bidder to be used for the Alternate and the affected portion of the Work.
4. Failure to Submit: In accordance with RCW 39.30.060, failure of a Bidder to submit as part of the Bid the names of such proposed HVAC, plumbing, and electrical Sub-Bidders or to name itself to perform such Work or the naming of two or more Sub-Bidders to perform the same Work shall render the Bidder's Bid non-responsive and, therefore, void.

5. Requirement to Subcontract: The Bidder, if Awarded the Contract, will subcontract with the listed Sub-Bidders for performance of the portion of the Work designated on the Bid Form, subject to the provisions of the Contract for Construction and RCW 39.30.060. The Bidder shall not substitute a listed Sub-Bidder in furtherance of bid shopping or bid peddling.
6. Sub-Bidder Qualification: Listed Sub-Bidders may be required to provide evidence of their qualifications, including a statement of experience and references, prior to Award, or at any time during the Contract Time. Such information shall be provided within 24 hours of request. This evidence shall demonstrate that the Sub-Bidder meets or exceeds all requirements for experience, qualifications, manufacturer's certifications, or any other requirements specified in any of the technical sections of the Contract Documents for which the Sub-Bidder proposes to perform Work.
7. Replacement: If a listed Sub-Bidder fails to provide adequate evidence of qualifications, is unable to comply with any bonding requirements of the Bidding Documents or with other requirements of the Contract or Bidding Documents, is not properly licensed, or fails to meet the Responsibility Criteria of the Bidding Documents, the Port may require the Bidder to replace the Sub-Bidder with another subcontractor reasonably acceptable to the Port at no change in the Contract Sum or Contract Time.
8. Sub-Bidder Standards: Sub-Bidders shall meet contractual and technical qualification standards, and provide specialized certification, licensing, and/or payment and performance bonding, if required.
9. Small business participation encouraged: The Port's policy is to encourage the Contractor to solicit and document participation, and to provide and promote the maximum lawful, practicable opportunity for increased participation, by small business enterprises.

C. BID SECURITY

1. Purpose and Procedure. Each Bid shall be accompanied by Bid security payable to the Port in the form required by the Bidding Documents and equal to five percent (5%) of the Base Bid only (i.e., not including any Alternates or Unit Prices). The Bid security constitutes a pledge by the Bidder to the Port that the Bidder will enter into the Contract with the Port in the form provided, in a timely manner, and on the terms stated in its Bid, and will furnish in a timely manner the payment and performance bonds, certificates of insurance, and all other documents required in the Contract Documents. Should the Bidder fail or refuse to enter into the Contract or fail to furnish such documents, the amount of the Bid security shall be forfeited to the Port as liquidated damages, not as a penalty. By submitting a Bid, each Bidder represents and agrees that the Bid security, if forfeited, is a reasonable prediction on the Bid Date of future damages to the Port.
2. Form. The Bid security shall be in the form of a certified or bank cashier's check payable to the Port or a Bid bond executed by a bonding company reasonably acceptable to the Port licensed in the State of Washington, registered with the Washington State Insurance Commissioner, possess and A.M. Best rating of "A minus, Fiscal Size Category (FSC) (6) or better and be authorized by the U.S. Department of the Treasury. The Bid security shall be signed by the person or persons legally authorized to bind the Bidder. Bid bonds shall be submitted using the form included with the Bidding Documents.
3. Retaining Bid Security. The Port will have the right to retain the Bid security of Bidders to whom an Award is being considered until the earliest of either (a) mutual execution of the Contract, and the Port's receipt of payment and performance bonds, or (b) the specified time has elapsed so that Bids may be withdrawn, or (c) when all Bids have been rejected.

4. Return of Bid Security. Within sixty (60) days after the Bid Date, the Port will release or return Bid securities to Bidders who's Bids are not to be further considered in Awarding the Contract. Bid securities of the three apparent low Bidders will be held until the Contract has been finally executed, after which all unforfeited Bid securities will be returned. Bid security may be returned in the form provided or by separate payment.

D. SUBMISSION OF BIDS

1. Procedure. The Bid, the Bid security, and other documents required to be submitted with the Bid shall be enclosed in a sealed envelope identified with the Project name and number and the Bidder's name and address. If the Bid is sent by mail the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face of the mailing envelope.
 - a. If a Bid is mailed, it shall be addressed to the Port of Tacoma, Contracts Department, One Sitcum Plaza, Tacoma, WA 98421.
 - b. If a Bid is delivered, it shall be delivered to the Front Reception Desk, Port of Tacoma, One Sitcum Plaza, Tacoma, WA 98421.
 - c. The time stamp clock at the Front Reception Desk at One Sitcum Plaza is the Port's official clock.
2. Deposit. Bids shall be deposited at the designated location prior to the Bid Date indicated in the Advertisement or Invitation to Bid, or any extension thereof made by Addendum. Bids received after the Bid Date and time specified shall be returned without consideration at the discretion of the Port or rejected at the time of receipt.
3. Delivery. The Bidder assumes full responsibility for timely delivery at the location designated for receipt of Bids.
4. Form. Oral, facsimile, telephonic, electronic, or email Bids are invalid and will not be considered.

E. MODIFICATION OR WITHDRAWAL OF BID

1. After the Bid Date. A Bid may not be modified, withdrawn or canceled by the Bidder during a sixty (60) day period following the Bid Date, and each Bidder so agrees by virtue of submitting its Bid.
2. Before the Bid Date. Prior to the Bid Date, any Bid submitted may be modified or withdrawn only by notice to the party receiving Bids at the place designated for receipt of Bids. The notice shall be in writing with the signature of the Bidder and shall be worded so as not to reveal the amount of the original Bid. Email notice will not be accepted. It shall be the Bidder's sole responsibility to verify that the notice has been received by the Port in time to be withdrawn before the Bid opening.
3. Resubmittal. Withdrawn Bids may be resubmitted up to the time designated for the receipt of Bids provided that they are then fully in conformance with these Instructions to Bidders.
4. Bid Security with Resubmission. Bid security shall be in an amount sufficient for the Bid as modified or resubmitted.

F. COMMUNICATIONS

1. Communications from a Bidder related to these Instructions to Bidders must be in writing to procurement@portoftacoma.com. Communications, including but not limited to notices

and requests, by Sub-Bidders shall be made through the Bidder and not directly by a Sub-Bidder to the Port.

1.05 CONSIDERATION OF BIDS

- A. OPENING OF BIDS: Unless stated otherwise in the Advertisement or Invitation to Bid or an Addendum, the properly identified Bids received on time will be opened publicly and will be read aloud. An abstract of the Base Bids and any Alternate Bids will promptly (and generally within 24 hours) be made available to Bidders and other interested parties.
- B. REJECTION OF BIDS: The Port shall have the right but not the obligation to reject any or all Bids for any reason or for no reason, to reject a Bid not accompanied by the required Bid security, or to reject a Bid which is in any way incomplete or irregular.
- C. BIDDING MISTAKES: The Port will not be obligated to consider notice of claimed Bid mistakes received more than 24 hours after the Bid Date. In accordance with Washington law, a low Bidder that claims error and fails to enter into the Contract is prohibited from Bidding on the Project if a subsequent call for Bids is made for the Project.
- D. ACCEPTANCE OF BID (AWARD)
 - 1. Intent to Accept. The Port intends (but is not bound) to Award a Contract to the Responsible Bidder with the lowest responsive Bid, provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available. The Port has the right to waive any informality or irregularity in any Bid(s) received and to accept the Bid which, in its judgment, is in its own best interests.
 - 2. Alternates. The Port shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Contract or Bidding Documents, and to determine the low Bidder on the basis of the sum of the Base Bid and the Alternates (if any) accepted. Failure to submit Bids on all Alternates may be cause for rejecting the Bidder's entire Bid. The Port retains the right to accept Alternate Bid items at the price Bid within sixty (60) days after the Contract is executed.
 - 3. Requirements for Award. Before the Award, the lowest responsive Bidder must be deemed Responsible by the Port and must satisfy all Award Requirements.
- E. BID PROTEST PROCEDURES
 - 1. Procedure. A Bidder protesting for any reason the Bidding Documents, a Bidding procedure, the Port's objection to a Bidder or a person or entity proposed by the Bidder, including but not limited to a finding of non-Responsibility, the Award of the Contract or any other aspect arising from or relating in any way to the Bidding shall cause a written protest to be filed with the Port within two (2) business days of the event giving rise to the protest. (Intermediate Saturdays, Sundays, and legal holidays are not counted as business days.) The written protest shall include the name of the protesting Bidder, the bid solicitation number and title under which the protest is submitted, a detailed description of the specific factual and legal grounds for the protest, copies of all supporting documents, evidence that the apparent low bidder has been given notice of the protest, and the specific relief requested. The written protest shall be sent by email to procurement@portoftacoma.com.
 - 2. Consideration. Upon receipt of the written protest, the Port will consider the protest. The Port may, within three (3) business days of the Port's receipt of the protest, provide any other affected Bidder(s) the opportunity to respond in writing to the protest. If the protest is not resolved by mutual agreement of the protesting Bidder and the Port, the Contracts Director of the Port or his or her designee will review the issues and promptly furnish a

final and binding written decision to the protesting Bidder and any other affected Bidder(s) within six (6) business days of the Port's receipt of the protest. (If more than one (1) protest is filed, the Port's decision will be provided within six (6) business days of the Port's receipt of the last protest.) If no reply is received from the Port during the six (6) business-day period, the protest will be deemed rejected.

3. Waiver. Failure to comply with these protest procedures will render a protest waived.
4. Condition Precedent. Timely and proper compliance with and exhaustion of these protest procedures shall be a condition precedent to any otherwise permissible judicial consideration of a protest.

1.06 POST BID INFORMATION

A. THE LOWEST RESPONSIVE BIDDER SHALL:

1. Responsibility Detail Form. Within 24 hours of the Low Responsive Bidder Selection Notification, the apparent low Bidder shall submit to the Port the Responsibility Detail Form and Project Example Sheets (Section 00 45 13) executed by an authorized company officer. As requested from the Port, the low, responsive Bidder shall provide written confirmation that the person signing the Bid on behalf of the Bidder was duly authorized at the time of bid, a detailed breakdown of the Bid in a form acceptable to the Port, and other information required by the Port.
2. Within ten (10) days after the Port's Notice of Award of the Contract, the apparent low Bidder shall also submit to the Port:
 - a. additional information regarding the use of the Bidder's own forces and the use of subcontractors and suppliers;
 - b. the names of the persons or entities (including a designation of the Work to be performed with the Bidder's own forces, and the names of those who are to furnish materials or equipment fabricated to a special design) proposed for each of the principal portions of the Work (i.e., either a listed Sub-Bidder or a Sub-Bidder performing Work valued at least ten percent (10%) of the Base Bid), consistent with the listing required with the Bid; and
 - c. the proprietary names and the suppliers of the principal items or systems of materials and equipment proposed for the Work.
3. Failure to provide any of the above information in a timely manner will constitute an event of breach permitting forfeiture of the Bid security.
4. Bidder Responsibility. The Bidder will be required to establish to the satisfaction of the Port the reliability and Responsibility of itself and the persons or entities proposed to furnish and perform the Work described in the Bidding Documents. If requested, the Bidder shall meet with the Port to discuss the Bid, including any pricing, the Bid components, and any assumptions made by the Bidder.
5. Sub-Bidder Responsibility. The Responsibility of the Bidder may be judged in part by the Responsibility of Sub-Bidders. Bidders must verify the Responsibility Criteria for each first-tier Sub-Bidder. A Sub-Bidder of any tier that hires other Sub-Bidders must verify Responsibility Criteria for each of its lower-tier Sub-Bidders. The verification shall include a representation that each Sub-Bidders, at the time of subcontract execution, is Responsible and possesses required licenses.
6. Objection. Prior to an Award of the Contract, the Port will notify the Bidder in writing if the Port, after due investigation, has reasonable objection to the Bidder or a person or entity

proposed by the Bidder. Upon receiving such objection, the Bidder may, at Bidder's option, (1) withdraw their Bid, (2) submit an acceptable substitute person or entity with no change in the Contract Time and no adjustment in the Base Bid or any Alternate Bid, even if there is a cost to the Bidder occasioned by such substitution, or (3) file a protest in accordance with the Bidding Documents.

7. Change. Persons and entities proposed by the Bidder to whom the Port has made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Port.
8. Right to Terminate. The Bidder's representations concerning its qualifications will be construed as a covenant under the Contract. If a Bidder makes a material misrepresentation on a Qualification Statement, the Port has the right to terminate the Contract for cause and may then pursue any remedies that exist under the Contract or that are otherwise available.

- B. INFORMATION FROM OTHER BIDDERS: All other Bidders designated by the Port as under consideration for Award of a Contract shall also provide a properly executed Qualification Statement, if so requested by the Port.

1.07 PERFORMANCE BOND, LABOR AND MATERIAL PAYMENT BOND, AND INSURANCE

- A. BOND REQUIREMENTS: Within ten (10) days after the Port's Notice of Award of the Contract, the successful Bidder shall obtain and furnish statutory bonds pursuant to RCW 39.08 covering the faithful performance of the Contract and the payment of all obligations arising thereunder in the form and amount prescribed in the Contract Documents. The cost of such bonds shall be included in the Base Bid.
- B. TIME OF DELIVERY AND FORM OF BONDS: The successful Bidder shall deliver an original copy of the required bonds to the Port, 1 Sitcum Plaza, Tacoma, WA 98421, within the time specified in the Contract Documents.
- C. INSURANCE: a certificate of insurance from the Bidder's insurance company that meets or exceeds all requirements of the Contract Documents;
- D. GOVERNMENTAL REQUIREMENTS: Notwithstanding anything in the Bidding or Contract Documents to the contrary, the Bidder shall provide all bonding, insurance and permit documentation as required by governmental authorities having jurisdiction for any portions of the Project.

1.08 FORM OF AGREEMENT

- A. FORM TO BE USED: The Contract for the Work will be written on the form(s) contained in the Bidding Documents, including any General, Supplemental or Special Conditions, and the other Contract Documents included with the project manual.
- B. CONFLICTS: In case of conflict between the provisions of these Instructions and any other Bidding Document, these Instructions shall govern. In case of conflict between the provisions of the Bidding Documents and the Contract Documents, the Contract Documents shall govern.
- C. CONTRACT DELIVERY. Within ten (10) days after Notice of Award, the Bidder shall submit a signed Contract to the Port in the form tendered to the Bidder and without modification.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions and Supplementary Conditions, and Division 0 and 1 Specifications sections shall apply to all sections of the Contract Documents, including specifications, drawings, addenda, or other changes of documents issued for bidding.

1.02 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions during bidding.

1.03 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
- B. The bidding documents include performance specifications for products and equipment which meet project requirements. In those cases where a representative item or manufacturer is named in the specification, it is provided for the sole purpose of identifying a product meeting the required functional performance, and where the words "or equal" are used, a substitution request as further described, is not required.
- C. Where non-competitive or sole source products or manufacturers are explicitly specified with the words "or approved equal", or "Engineer approved equal", or "as approved by the Engineer" are used, they shall be taken to mean "or approved equal". In these cases a substitution request as further described in this section, is required.

1.04 SUBMITTALS

- A. Pre-Bid Substitution Requests: Submit one PDF of the substitution request form along with all supporting documentation for consideration of each request. Identify product or fabrication or installation method to be replaced. Include Drawing numbers and titles. Substitution requests prior to bid date may originate directly from a prime bidder, or from a prospective supplier or subcontractor.
 - 1. Substitution Request Form: Use copy of form located in Section 00 43 25.
 - 2. Documentation: Show compliance with requirements for substitutions with the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided.
 - b. Coordination information, including a list of changes or modifications needed to other parts of the Work that will be necessary to accommodate proposed substitution.
 - c. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - d. Samples, where applicable or requested.
 - e. Certificates and qualification data, where applicable or requested.
 - f. Research reports evidencing compliance with building code in effect for project
 - 3. Engineer's Action: Engineer will review substitution requests if received electronically to procurement@portoftacoma.com at least 7 days prior to the bid opening date set forth in these documents. Substitution requests received after this time will not be reviewed.

- a. Forms of Acceptance: Substitution requests will be formally accepted via written addendum prior to the bid opening date. Bidders shall not rely upon approvals made in any other manner.
 - b. Use product originally specified if Engineer does not issue a decision on use of a proposed substitution within time allocated.
 - c. The Port's decision of approval or disapproval of a proposed substitution shall be final.
- B. Substitutions will not be considered when:
- 1. Indicated or implied on shop drawings or product data submittals without formal request submitted in accordance with this Section.
 - 2. Acceptance will require substantial revision of Contract Documents or other items of the Work.
 - 3. Submittal for substitution request does not include point-by-point comparison of proposed substitution with specified product.

1.05 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 EXISTING CONDITIONS

- A. Certain information relating to existing surface and subsurface conditions and structures is available to bidders but will not be part of the Contract Documents, as follows:
- B. Geotechnical Report: Entitled Supplemental Geotechnical Site Investigation Summary and Recommendations Proposed Auto Import Terminal for Port of Tacoma, dated December 29, 2017.
 - 1. This report identifies properties of below grade conditions and offers recommendations for the design of foundations, prepared primarily for the use of Engineer.
 - 2. The recommendations described shall not be construed as a requirement of this Contract, unless specifically referenced in the Contract Documents.

1.02 AVAILABILITY

- A. Reference Documents are available on-line through The Port of Tacoma's Website www.portoftacoma.com. Click on "Contracts"; "Procurement", and then the Procurement Number.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section provides the notification required for disclosure of asbestos, lead-containing or other hazardous materials.

1.02 HAZARDOUS MATERIALS NOTICE

- A. Contractor is notified that certain portions of the Work area are known to contain lead or asbestos-containing materials (ACM), as detailed in a Hazardous Materials Assessment, Hazardous Building Materials Assessment, dated 1/3/18 A copy of the assessment is included Appendix B.
- B. Contractor is notified that certain areas of the Work area are known to contain hazardous substances in soil and groundwater, as detailed in Consent Decree 16-2-12406-8 filed on November 14, 2016 and the associated Environmental (Restrictive) Covenant filed on April 17, 2017. Requisite notice associated with the Work was provided by the Port on January 19, 2018 and acknowledged by the Department of Ecology on January 24, 2018. See documentation included in the Appendix A.

1.03 NOTIFICATION AND SUSPENSION

- A. In the event the Contractor detects the presence of potentially contaminated materials not previously identified in this specification, the Contractor shall immediately notify the Port. Following such notification by the Contractor, the Port shall in turn notify the various governmental and regulatory agencies concerned with the presence of potentially contaminated materials, if warranted. Depending upon the type of contaminated materials identified, the Port may suspend work in the vicinity of the discovery under the provisions of General Conditions.
- B. Following completion of any further testing necessary to determine the nature of the materials involved, the Port will determine how the material shall be managed. Although the actual procedures used in resuming the work shall depend upon the nature and extent of the potentially contaminated material, the following alternate methods of operation are foreseen as possible:
 - 1. Contractor to resume work as before the suspension.
 - 2. Contractor to move its operations to another portion of the work until measures to eliminate any hazardous conditions can be developed and approved by the appropriate regulatory agencies.
 - 3. The Port to direct the Contractor to dispose or treat the material in an approved manner.
 - 4. The Port to terminate or modify the Contract.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS
SECTION 00 43 13 - BID SECURITY FORM

KNOW ALL MEN BY THESE PRESENTS:

That we, _____, as Principal, and _____, as Surety, are held and firmly bound unto the PORT OF TACOMA as Obligees, in the penal sum of _____ Dollars, for the payment of which the Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigned, jointly and severally, by these present.

The condition of this obligation is such that if the Obligees shall make any award to the Principal for _____, according to the terms of the proposal or bid made by the Principal therefor, and the Principal shall duly make and enter into a contract with the Obligees in accordance with the terms of said proposal or bid and award and shall give bond for the faithful performance thereof, with Surety or Sureties approved by the Obligees; or, if the principal shall, in case of failure to do so, pay and forfeit to the Obligees the penal amount of the deposit specified in the call for bids, then this obligation shall be null and void; otherwise it shall be and remain in full force and effect and the Surety shall forthwith pay and forfeit to the Obligees, as penalty and liquidated damages, the amount of this bond.

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

BY _____
Principal

BY _____
Surety

Agent and Address

Note: Bidder may submit Surety's bid bond form, provided it is similar in substance, made out in the name of the Port of Tacoma, and that the agent's name and address appear as specified. Bonds containing riders limiting responsibility for toxic waste or limiting the term of responsibility will be rejected.

END OF SECTION

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS
SECTION 00 43 25 - SUBSTITUTION REQUEST FORM

Project Title: Parcel 77 Auto Import
Terminal

Project No. 201020.01

Submitted By: _____

Contract No. 070770

Prime/Sub/Supplier: _____

Date: _____

Specification Title: _____

Section No. _____

Description: _____

Paragraph: _____

Page No. _____

Proposed
Substitution: _____

Trade Name: _____

Model No. _____

Manufacturer: _____

Address: _____

Phone 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: _____ Email: _____

Supporting Data Attached:

☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ Other _____

ENGINEER'S REVIEW AND ACTION

- ☐ Substitution approved
- ☐ Substitution approved as noted
- ☐ Substitution rejected - Use specified materials.
- ☐ Substitution Request received too late - Use specified materials.

Signed By: _____ Date: _____

END OF SECTION

THE LOW RESPONSIVE BIDDER SHALL BE REQUIRED TO COMPLETE THIS RESPONSIBILITY DETAIL FORM AS SPECIFIED IN SECTION 00 21 00 – INSTRUCTIONS TO BIDDERS. THIS COMPLETED RESPONSIBILITY DETAIL FORM SHALL BE SUBMITTED ELECTRONICALLY (PDF) VIA EMAIL TO THE CONTACT(S) IDENTIFIED IN THE LOW RESPONSIVE BIDDER SELECTION NOTIFICATION. THIS IS NOT TO BE SUBMITTED WITH A BID.

BIDDER'S COMPANY NAME: _____

For the below Mandatory Bidder Responsibility Criteria, please check the appropriate box.
--

1.0 MANDATORY BIDDER RESPONSIBILITY CRITERIA

- A. The Bidder shall meet the following mandatory responsibility criteria as described in RCW 39.04.350(1). The Bidder shall be rejected as not responsible if any answer to questions 1 through 5 is "No" or any answer to questions 6 through 8 is "Yes."
1. Does the Bidder have a Certificate of Registration in compliance with RCW 18.27?
_____ YES _____ NO
 2. Does the Bidder have a current Washington State Unified Business Identifier number?
_____ YES _____ NO
 3. Does the Bidder have Industrial Insurance Coverage for the Bidder's employees working in Washington State as required in RCW 51?
_____ YES _____ NO
 4. Does the Bidder have an Employment Security Department number as required in RCW 50?
_____ YES _____ NO
 5. Does the Bidder have a Washington State Excise Tax Registration number as required in RCW 82?
_____ YES _____ NO
 6. Has the Bidder been disqualified from bidding on any public works project under RCW 39.06.010 or 39.12.065(3)?
_____ YES _____ NO
 7. Has the Bidder violated RCW 39.04.370 more than one time as determined by the Washington State Department of Labor and Industries?
_____ YES _____ NO
 8. Has the Bidder ever been found to be out of compliance with Apprenticeship Utilization requirements of RCW 39.04.320?
_____ YES _____ NO

If any answer to questions 1 through 5 is "No" or any answer to questions 6 through 8 is "Yes" - **STOP HERE** and contact the Contract Administrator. The Bidder is not responsible for this Work. Otherwise proceed to 1.1. **Provide attached to this completed form documentation to confirm responsibility criteria.**

For remaining criteria below, check or fill-out the appropriate box. Based upon the answer provided by the Bidder, the Port may request additional information or seek further explanation. As needed, provide backup documentation for any explanations listed below.

1.1 CONTRACT AND REGULATORY HISTORY

- A. The Port will evaluate whether the Bidder's contract and regulatory history demonstrates an acceptable record of past project performance and consistent responsibility. The Bidder shall answer the following questions. The Bidder may be rejected as not responsible if any answer to questions 1 through 5 below is "Yes".
1. Has the Bidder had a contract terminated for cause or default, in the last 5 years?
_____ YES _____ NO **If YES, please explain below.**
 2. Has the Bidder required a Surety to take over all, or a portion of, a project to cure or respond to an asserted default or material breach of contract on the part of the Bidder on any public works project, in the last 5 years?
_____ YES _____ NO **If YES, please explain below.**
 3. Have the Bidder and major Sub-Bidders been in bankruptcy, reorganization and/or receivership on any public works project, in the last 5 years?
_____ YES _____ NO **If YES, please explain below.**
 4. Have the Bidder and major Sub-Bidders been disqualified by any state or local agency from being awarded and/or participating on any public works project, in the last 5 years?
_____ YES _____ NO **If YES, please explain below.**

1.2 ACCIDENT/INJURY EXPERIENCE

- A. The Port will evaluate the Bidder's accident/injury Experience Modification Factor ("EMF") from the Washington State Department of Labor and Industries to assess whether the Bidder has an acceptable safety record preventing personal injuries on projects.
- B. List the Bidder's accident/injury EMF for the last five (5) years. An experience factor is calculated annually by the Washington State Department of Labor and Industries.

YEAR	EFFECTIVE YEAR	EXPERIENCE FACTOR
1		
2		
3		

4		
5		

If the Bidder has received an EMF of greater than 1.0 for any year, explain the cause(s) of the designation and what remedial steps were taken to correct the EMF. The Bidder may be rejected as not responsible if the Bidder's EMF is greater than 1.0 and sufficient remedial steps have not been implemented.

1.3 WORK PERFORMED BY BIDDER

- A. The Bidder shall state the amount of the Contract Work, as an equivalent to the Total Bid Price, excluding taxes, insurance and bonding, the Bidder will execute with its own forces.

_____%

1.4 PROJECT EXAMPLE SHEETS

- A. As part of completing this Responsibility Detail Form, the Bidder shall be required to complete the following Project Example Sheets. The Bidder shall provide one project example sheet for each project submitted.
- B. If necessary, the Bidder shall print the appropriate number of additional Project Example Sheets in order to satisfy the project information requirements.**
- C. The Bidder's failure to provide the required project information may result in a determination of the Bidder being declared non-responsible by the Port.
- D. The Bidder shall submit its completed Project Example Sheets with this SIGNED Responsibility Detail Form electronically (PDF) via email to the Contact(s) noted on the Low Responsive Bidder Selection Notification.

PROJECT: PARCEL 77 AUTO IMPORT TERMINAL
PROJECT NUMBER: 201020.01 | CONTRACT NUMBER: 070770

The information provided below is true and complete.	
Signature of Authorized Representative	Date
Print Name and Title	

END OF SECTION

THIS AGREEMENT is made and entered into by and between the PORT OF TACOMA, a State of Washington municipal corporation, hereinafter designated as the "Port," and:

The "Contractor":	<div></div> <div></div> <div></div> <div></div>	(Legal Name) (Address) (Address 2) (Phone No.)
The "Project" is:	<div>Parcel 77 Auto Import Terminal</div> <div>201020.01 070770</div> <div>3400 Taylor Way</div> <div>Tacoma, WA</div>	(Title) (Project/ Contract No.) (Project Address) (Project Address 2)
The "Engineer" is:	<div>Jane Vandenberg, PE</div> <div>Director of Engineering</div> <div>jvandenberg@portoftacoma.com</div> <div>(253) 592-6777</div>	(Engineer) (Title) (Email) (Phone No.)
The "Contractor's Representative" is:	<div></div> <div></div> <div></div> <div></div>	(Representative) Title (Email) (Phone No.)

BACKGROUND AND REPRESENTATIONS:

The Port has caused Drawings, Specifications, and other Contract Documents to be prepared for the performance of Work on the Project.

The Port publicly solicited bids on the Contract Documents. The Contractor submitted a bid to the Port on the _____ day of _____, 20__ to perform the Work.

The Contractor represents that it has the personnel, experience, qualifications, capabilities, and means to accomplish the Work in strict accordance with the Contract Documents, within the Contract Time and for the Contract Price, and that it and its Subcontractors satisfy the responsibility criteria set forth in the Contract Documents, including any supplemental responsibility criteria.

The Contractor further represents that it has carefully examined and is fully familiar with all provisions of the Contract Documents, including any Addenda, that it has fully satisfied itself as to the nature, location, difficulty, character, quality, and quantity of the Work required by the Contract Documents and the conditions and other matters that may be encountered at or near the Project site(s), or that may affect performance of the Work or the cost or difficulty thereof including all applicable safety and site responsibilities, and that it understands and can satisfy all scheduling and coordination requirements and interim milestones.

AGREEMENT:

The Port and the Contractor agree as follows:

1.0 CONTRACTOR TO FULLY PERFORM THE WORK

The Contractor shall fully execute and complete the entire Work described in the Contract Documents, except to the extent specifically indicated in the Agreement, the General Conditions of the Contract (as well as any Supplemental, Special or other Conditions included in the project manual), the Drawings, the Specifications, and all Addenda issued prior to, and all modifications issued after, execution of the Contract.

2.0 DATE OF COMMENCEMENT

The date of commencement of the Work, which is the date from which the Contract Time is measured, shall be fixed as the date this agreement is executed.

3.0 CONTRACT TIME AND LIQUIDATED DAMAGES

The Contractor shall achieve the Interim Milestone for Phase 1 portions of the work as set forth in Section 01 14 00, Work Restrictions by **December 15, 2018 and Substantial Completion of the entire Work not later than July 31, 2019 , subject to adjustments of this Contract Time as provided in the Contract Documents. The Contractor shall achieve Final Completion of the Work within 30 calendar days of the date on which Substantial Completion is achieved.**

Provisions for liquidated damages as a reasonable estimate of future loss, as of the date of this Agreement, are included in the Contract Documents. The parties agree that the stated liquidated damages are not penalties individually or cumulatively.

Tet liquidated damages for failure to achieve Interim Milestone for Phase 1 portion of the work by the prescribed date shall be **\$5,000** per calendar day and liquidated damages for the failure to meet the prescribed date of Substantial Completion shall be **\$4,500** per calendar day.

Liquidated damages assessed by the Port will be deducted from monies due to the Contractor, or from monies that will become due to the Contractor. The liquidated damages, as specified and calculated herein, shall be levied for each and every calendar day that Substantial Completion and/or Final Completion of the work is delayed beyond the prescribed completion dates, or the completion dates modified by the Port for extensions of the contract time.

4.0 CONTRACT PRICE

In accordance with the Contractor's bid dated _____, the Port shall pay the Contractor in current funds for the Contractor's performance of the Contract the Contract Price of _____ Dollars (\$_____), subject to additions and deductions as provided in the Contract Documents. State and local sales tax is not included in the Contract Price but will be due and paid by the Port with each progress payment.

6.0 INSURANCE AND BONDS

The Contractor shall purchase and maintain insurance and provide bonds as set forth in the Contract Documents.

5.0 INSURANCE AND BONDS

The Contractor shall purchase and maintain insurance and provide bonds as set forth in the Contract Documents.

This Agreement is entered into as of the day and year first written above:

CONTRACTOR

PORT OF TACOMA

By: _____

By: _____

Title: _____

Title: _____

Date: _____

Executi
on
Date: _____

END OF SECTION

PERFORMANCE BOND # _____

CONTRACTOR (NAME AND ADDRESS)

SURETY (NAME AND PRINCIPLE PLACE OF BUSINESS)

OWNER (NAME AND ADDRESS)

**PORT OF TACOMA
P.O. BOX 1837
TACOMA, WA 98401-1837**

AGENT OR BROKER (FOR INFORMATION ONLY)

KNOW ALL MEN BY THESE PRESENTS:

That _____ as Principal, hereinafter called Contractor, and _____ as Surety, hereinafter called Surety, are held and firmly bound unto the Port of Tacoma as Obligee, hereinafter called the Port, in the amount of _____ Dollars (\$ _____) for the payment whereof Contractor and Surety bind themselves, their executors, administrators, legal representatives, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS:

Contractor has executed an agreement with the Port dated _____ for _____ a copy of which Contract is by reference made a part hereof (the term "Contract" as used herein to include the aforesaid agreement together with all the Contract Documents, addenda, modifications, all alterations, additions thereto, deletions therefrom and any other document or provision incorporated into the Contract) and is hereinafter referred to as the Contract.

This bond is executed and issued pursuant to the provisions of Chapter 39.08 Revised Code of Washington.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if Contractor shall promptly and faithfully perform said Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

FURTHER:

- A. Surety hereby waives notice of any alterations, change orders, modifications or extensions of time made by the Port.

- B. Surety recognizes that the Contract includes provisions for additions, deletions and modifications to the work or Contract Time and the amounts payable to the Contractor. Subject to the limitations contained in (A) above, Surety agrees that no such addition, deletion, or modification, or any combination thereof, shall avoid or impair Surety's obligation hereunder.
- C. Whenever Contractor has been declared by the Port to be in default, and the Port has given Surety notice of the Port's determination of such default, Surety shall promptly (in no event more than fifteen (15) days following receipt of such notice) advise the Port of its intended action to:
1. Remedy the default within fifteen (15) days following its advice to the Port as set forth above, or
 2. Assume within fifteen (15) days, following its advice to the Port as set forth above, completion of the Contract in accordance with the Contract Documents and become entitled to payment of the balance of the Contract Sum, or
 3. Pay the Port upon completion of the Contract, in cash, the cost of completion together with all other reasonable costs and expenses incurred by the Port as a result of the Contractor's default, including but not limited to, those reasonable costs and expenses incurred by the Port in its efforts to mitigate its losses, which may include but are not limited to, attorneys fees and efforts to complete the Work prior to the Surety exercising the options available to it as set forth herein.
- D. If the Port shall commence suit and obtain judgment against the Surety for recovery hereunder, then the Surety, in addition to such judgment, shall pay all costs and attorney's fees incurred by the Port in enforcement of its rights hereunder. Venue for any action arising out of or in connection with this bond shall be in Pierce County, Washington.
- E. No right or action shall accrue on this bond to or for the use of any person or corporation other than the Port of Tacoma.

Signed and Sealed the _____ day of _____, 20__.

IMPORTANT: Surety companies executing bonds must have an A.M. Best Rating of A- FSC of (6) or higher, appear on the Treasury Department's most current list (Circular 570 as amended), have an underwriting limitation of not less than the Contract Sum, and be authorized to transact business in the State of Washington.

SURETY

CONTRACTOR

Signature

Signature

Print Name and Title

Print Name and Title

END OF SECTION

LABOR AND MATERIAL PAYMENT BOND # _____

KNOW ALL MEN BY THESE PRESENTS:

That _____ as Principal, hereinafter called Contractor, and _____ as Surety, hereinafter called Surety, are held and firmly bound unto the Port of Tacoma as Obligee, hereinafter called the Port, and all others entitled to recovery hereunder, in the amount of _____ Dollars (\$_____) for the payment whereof Contractor and Surety bind themselves, their executors, administrators, legal representatives, successors and assigns, jointly and severally firmly by these presents.

WHEREAS:

Contractor has executed an agreement with the Port dated _____ for _____ a copy of which Contract is be reference made a part hereof (the term "Contract" as used herein to include the aforesaid agreement together with all the Contract Documents, addenda, modifications, alterations, additions thereto, deletions therefrom and any other documents or provisions incorporated into the Contract) and is hereinafter referred to as the Contract.

This bond is executed pursuant to the provisions of Chapter 39.08 Revised Code of Washington.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if Contractor shall promptly make payment to all claimants, as hereinafter defined, for all labor and material used or reasonably required for use in the performance of the Contract and shall indemnify and save the Port harmless from all cost and damage by reason of Contractor's default, then this obligation shall be null and void; otherwise it shall remain in full force and effect, subject to the following conditions:

- A. The Surety hereby waives notice of any alterations, change orders, modifications or extensions of time made by the Port.
- B. Surety recognizes that the Contract includes provisions for additions, deletions and modifications to the Work or Contract Time and the amounts payable to the Contractor. Surety agrees that no such addition, deletion, or modification, or any combination thereof, shall avoid or impair Surety's obligation hereunder.

- C. Surety hereby agrees that every person protected under the provisions of RCW 39.08.010 who has not been paid as provided under the Contract and pursuant to RCW 39.08.010, less any amounts withheld pursuant to statute, and less retainage withheld pursuant to RCW 60.28, after the expiration of a period of thirty (30) days after the date on which the completion of the Contract in accordance with RCW 39.08, may sue on this bond, prosecute the suit to final judgment as may be due claimant, and have execution thereon including recovery of reasonable costs and attorney's fees as provided by RCW 39.08. The Port shall not be liable for the payment of any costs or expenses of any such suit.
- D. No suit or action shall be commenced hereunder by any claimant unless claimant shall have given the written notices to the Port, and where required, the Contractor, in accordance with RCW 39.08.030.
- E. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of claims which may be properly filed in accordance with RCW 39.08 whether or not suit is commenced under and against this bond.
- F. If any Claimant shall commence suit and obtain judgment against the Surety for recovery hereunder, then the Surety, in addition to such judgment and attorney fees as provided by RCW 39.08.030, shall also pay such costs and attorney fees as may be incurred by the Port as a result of such suit. Venue for any action arising out of or in connection with this bond shall be in Pierce County, Washington.

Signed and Sealed this _____ day of _____, 2014.

IMPORTANT: Surety companies executing bonds must have an A.M. Best Rating of A-FSC of (6) or higher and appear on the Treasury Department's most current list (Circular 570 as amended), have an underwriting limitation of not less than the Contract Sum, and be authorized to transact business in the State of Washington.

SURETY

CONTRACTOR

Signature

Printed Name and Title

Printed Name and Title

Power of Attorney attached.

END OF SECTION

BOND NO. _____
PROJECT TITLE: PARCEL 77 AUTO IMPORT
TERMINAL
PROJECT NO. 201020.01
CONTRACT NO. 070770

KNOW ALL MEN BY THESE PRESENTS: That we _____,
a corporation existing under and by virtue of the laws of the State of Washington and
authorized to do business in the State of Washington, as Principal, and
_____, a corporation organized and
existing under the laws of the State of _____ and
authorized to transact the business of surety in the State of Washington, as Surety, are
jointly and severally held and bound unto the PORT OF TACOMA, hereinafter called
Port, as Obligee, and are similarly held and bound unto the beneficiaries of the trust fund
created by RCW 60.28 as their heirs, executors, administrators, successors and assigns
in the penal sum of _____
(_____) plus 5% of any increases in the contract amount that have occurred
or may occur, due to change orders, increases in the quantities or the addition of any
new item of work.

WHEREAS, on the _____ day of _____, the said Principal herein
executed Contract No. _____ with the Port for _____.

WHEREAS, said contract and RCW 60.28 require the Port to withhold from the
Principal the sum of 5% from monies earned by the Principal on estimates during the
progress of the work, hereinafter referred to as earned retained funds.

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

IT IS HEREBY DECLARED AND AGREED that the Surety shall be liable under this
obligation as Principal. The Surety will not be discharged or released from liability for any
act, omission or defenses of any kind or nature that would not also discharge the
Principal.

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

IN WITNESS WHEREOF, said Principal and said Surety have caused these presents to be duly signed and sealed this _____ day of _____, 201__.

By: _____
Principal

Address: _____
City/State/ _____
Zip: _____

Phone: _____

Surety
Name: _____

By: _____
Attorney-in-Fact

Address: _____
City/State/ _____
Zip: _____

Phone: _____

IMPORTANT: Surety companies executing bonds must have an A.M. Best Rating of A-FSC of (6) or higher, appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State of Washington.

END OF SECTION

ARTICLE 1 - THE CONTRACT DOCUMENTS

1.01 GENERAL

- A. Contract Documents form the Contract. The Contract Documents are enumerated in the Agreement between the Port and Contractor ("Agreement"). Together, the Contract Documents form the Contract. The Contract represents the entire integrated agreement between the parties and supersedes all prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only in writing and only as set forth in the Contract Documents.
- B. Headings only for convenience. The titles or headings of the sections, divisions, parts, articles, paragraphs, and subparagraphs of the Contract Documents are intended only for convenience.

1.02 DEFINITIONS

- A. "Contractor" means the person or entity contracting to perform the Work under these Contract Documents. The term Contractor includes the Contractor's authorized representative for purposes of identifying obligations and responsibilities under the Contract Documents, including the ability to receive notice and direction from the Port.
- B. "Day" means a calendar day unless otherwise specifically designated.
- C. "Drawings" are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, including plans, elevations, sections, details, and diagrams.
- D. "Engineer" is the Port employee generally tasked with administering the Project on the Port's behalf and the person with overall responsibility for managing, for the Port, the Project scope, budget, and schedule. To the extent empowered, the Engineer may delegate to others at the Port (such as a Project Manager or Inspector) the responsibility for performing delegated responsibilities of the Engineer's under this Contract.
- E. "Port" means the Port of Tacoma. The Port will designate in writing a representative (usually the Engineer) who shall have the authority to act on the Port's behalf related to the Project. The "Port" does not include staff, maintenance or safety workers, or other Port employees or consultants that may contact the Contractor or be present at the Project site.
- F. "Project" is identified in the Agreement and is the total construction to be performed by or through the Port, of which the Work performed under the Contract Documents may be only a part.
- G. "Specifications" are those portions of the Contract Documents that specify the written requirements for materials, equipment, systems, standards and workmanship for the Work and for the performance of related services.
- H. "Subcontractor" means a person or entity that contracts directly with the Contractor to perform any Work under the Contract Documents. "Subcontractor of any tier" includes Subcontractors as well as any other person or entity, including suppliers, that contracts with a Subcontractor or a lower-tier Subcontractor (also referred to as "Sub-subcontractors") to perform any of the Work.
- I. "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all labor, tools, equipment, materials, services and incidentals necessary to complete all obligations under the Contract Documents. The Work may constitute only a part of the Project, and may interface and need to be coordinated with the work of others.

1.03 INTENT OF THE CONTRACT DOCUMENTS

- A. Intent of Contract Documents. The intent of the Contract Documents is to describe the complete Work and to include all items necessary for the proper execution and completion of the Work by the Contractor.
- B. Contract Documents are complementary. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor is required to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.
- C. No third party contract rights. The Contract Documents shall not create a contractual relationship of any kind (1) between the Port and a Subcontractor of any tier (although the Port does not waive any third-party beneficiary rights it may otherwise have as to Subcontractors of any tier), (2) between the Contractor and the Engineer or other Port employees or consultants, or (3) between any persons or entities other than the Port and Contractor.

1.04 CORRELATION OF THE CONTRACT DOCUMENTS

- A. Precedence. In the event of a conflict or discrepancy between or among the Contract Documents, the conflict or discrepancy will be resolved by the following order of precedence: with an addendum or Change Order having precedence over an earlier document, and computed dimensions having precedence over scaled dimensions and large scale drawings take precedence over small scale drawings:
 - 1. The signed Agreement
 - a. Supplemental Conditions
 - b. General Conditions
 - c. Division 01 General Requirements of Specifications
 - d. All other Specifications, including all remaining divisions, material and system schedules and attachments, and Drawings
 - e. All other sections in Division 00 not specifically identified herein by Section.
- B. Inconsistency between or among Contract Documents. If there is any inconsistency between the Drawings, schedules, or Specifications, or any attachments, the Contractor will make an inquiry to the Engineer to determine how to proceed, and, unless otherwise directed, the Contractor will provide the better quality or greater quantity of any work or materials, as reasonably interpreted by the Port, at no change in the Contract Sum or Contract Time. Thus, if Work is shown on Drawings but not contained in Specifications or schedules, or contained in Specifications or schedules but not shown on the Drawings, the Work as shown or contained will be provided at no change in the Contract Sum or Contract Time, according to Specifications or Drawings to be issued by the Port.
- C. Inconsistency with law. In the event of a conflict between the Contract Documents and applicable laws, codes, ordinances, regulations or orders of governmental authorities having jurisdiction over the Work, or in the event of any conflict between such laws, the most stringent requirements govern.
- D. Organization of Contract Documents. The organization of the Specifications and Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of the Work to be performed. The Port assumes no responsibility for the division and proper coordination of Work between particular Subcontractors.

- E. Bid quantities are estimates only. Any “bid quantities” set forth in the Contract Documents are estimates only. The Port does not warrant that the actual amount of Work will correspond to any estimates. The basis of payment will be the actual quantities performed in accordance with the Contract Documents.

1.05 OWNERSHIP OF THE CONTRACT DOCUMENTS

- A. Port owns all Contract Documents. All Drawings, Specifications, and other Contract Documents furnished to the Contractor are Port property, and the Port retains all intellectual property rights, including copyrights. The Contract Documents are to be used only with respect to the Project.

ARTICLE 2 - PORT OF TACOMA

2.01 AUTHORITY OF THE ENGINEER

- A. Engineer will be Port’s representative. The Engineer or the Engineer’s designee will be the Port’s representative during the Project and will administer the Project on the Port’s behalf.
- B. Engineer may enforce all obligations. The Engineer has the authority to enforce all requirements imposed on the Contractor by the Contract Documents.
- C. Only Engineer is agent of Port. Other than the Engineer, no other Port employee or consultant is an agent of the Port, and none are authorized to agree on behalf of the Port to changes in the Contract Sum or Contract Time, nor to waive provisions of the Contract Documents, nor to direct the Contractor to take actions that change the Contract Sum or Contract Time, nor to accept notice of protests or claims on behalf of the Port.

2.02 ADMINISTRATION OF THE CONTRACT

- A. Port will administer Contract. The Port will provide administration of the Contract through the Engineer or the Engineer’s designee. All communications with the Port or its consultants related to the Contract will be through the designated representative.
- B. Port not responsible for means and methods. The Port is not responsible for, and will have no control or charge of, the means, methods, techniques, sequences, or procedures of construction, or for safety precautions or programs incidental thereto, because these are the sole responsibility of the Contractor. If the Port makes any suggestion of means, methods, techniques, sequences or procedures, the Contractor will exercise its independent judgment in deciding whether to adopt the suggestion, except as otherwise provided in the Contract Documents.
- C. Port not responsible for acts or omissions of Contractor or Subcontractors. The Port is not responsible for, and will have no control or charge of, the acts or omissions of the Contractor, Subcontractors of any tier, suppliers, or any of their agents or employees, or any other persons performing a portion of the Work.
- D. Port not responsible for the Work. The Port is not responsible for the Contractor’s failure to carry out the Work in accordance with the Contract Documents. The presence of the Engineer or others at the Project site at any time does not relieve the Contractor from its responsibility for non-conforming Work.
- E. Port will have access to the Work. The Port and its representatives will at all times have access to the Work in progress, and the Contractor will provide proper facilities for such access and for inspection.

2.03 INFORMATION PROVIDED BY THE PORT

- A. Port to furnish information with reasonable promptness. The Port shall furnish information and services required of the Port by the Contract Documents with reasonable promptness.
- B. Subsurface investigation. The Port may have undertaken a limited investigation of the soil and other subsurface conditions at the Project site for design purposes only. The results of these investigations will be available for the convenience of the Contractor, but they are not Contract Documents. There is no warranty or guarantee, express or implied, that the conditions indicated are representative of those existing at the site or that unforeseen developments may not occur. The Contractor is solely responsible for interpreting the information.

2.04 CONTRACTOR REVIEW OF PROJECT INFORMATION

- A. Contractor to familiarize itself with site and conditions of Work. Prior to executing the Contract, the Contractor shall visit the site, become generally familiar with local conditions under which the Work is to be performed, and correlate personal observations with the requirements of the Contract Documents. By signing the Contract, the Contractor confirms that the Contract Sum is reasonable compensation for the Work; that the Contract Time is adequate; that it has carefully examined the Contract Documents and the Project site; and that it has satisfied itself as to the nature, location, and character of the Work, the labor, materials, equipment, and other items required and all other requirements of the Contract Documents. The Contractor's failure fully to acquaint itself with any such condition does not relieve the Contractor from the responsibility for performing the Work in accordance with the Contract Documents, within the Contract Time, and for the Contract Sum.
- B. Contractor to review Contract Documents. Because the Contract Documents are complementary, the Contractor will, before starting each portion of the Work, carefully study and compare the various Drawings, Specifications, and other Contract Documents, as well as all information furnished by the Port.
- C. Contractor to confirm field conditions. Before starting each portion of the Work the Contractor shall take field measurements of and verify any existing conditions, including all Work in place, and all general reference points; shall observe any conditions at the site affecting the Contractor; and shall carefully compare field measurements, conditions and other information known to the Contractor with the Contract Documents.

2.05 PORT'S RIGHT TO REJECT, STOP AND/OR CARRY-OUT THE WORK

- A. Port may reject Work. The Port has the authority but not the obligation to reject work, materials and equipment that is defective or that otherwise does not conform to the Contract Documents, and to decide questions concerning the Contract Documents. However, the failure to so reject or the presence of the Port at the site shall not be construed as assurance that the Work is acceptable or being completed in compliance with the Contract Documents.
- B. Port may stop Work. If the Contractor fails to correct Work that does not comply with the requirements of the Contract Documents, or repeatedly or materially fails to properly carry out the Work, the Port may issue an order to stop all or a portion of the Work until the cause for the order has been eliminated. The Port's right to stop the Work shall not impose a duty on the Port to exercise this right for the benefit of the Contractor or any third party.
- C. Port may carry-out Work. If the Contractor fails to perform the Work properly, fails to perform any provision of this Contract, or fails to maintain the Progress Schedule, or if the Port reasonably concludes that the Work will not be completed in the specified manner or within the Contract Time, then the Port may, after three (3) days' written notice to the Contractor and without prejudice to any other remedy the Port may have, perform itself or have performed any

or all of the Work and may deduct the cost thereof from any payment then or later due the Contractor.

2.06 SEPARATE CONTRACTORS

- A. Port may engage separate contractors or perform work with its own forces. The Port may contract with other contractors ("Separate Contractor") in connection with the Project or perform work with its own forces. The Contractor shall coordinate and cooperate with any Port forces or Separate Contractors, as applicable. The Contractor shall provide reasonable opportunity for the introduction and storage of materials and the execution of work by others.
- B. Contractor to inspect work of others. If any part of the Contractor's Work depends on the work of the Port or any Separate Contractor, the Contractor shall inspect and promptly report to the Port, in writing, any defects that impact the Contractor. Failure of the Contractor to so inspect and report defects in writing shall constitute an acceptance by Contractor of the work of the Port or Separate Contractor.
- C. Contractor to resolve claims of others. Should the Contractor or any of its Subcontractors of any tier cause damage of any kind, including but not limited to delay, to any Separate Contractor, the Contractor shall promptly and using its best efforts settle or otherwise resolve the dispute with the Separate Contractor. The Contractor shall also promptly remedy damage caused to completed or partially completed construction.

2.07 OFFICERS AND EMPLOYEES OF THE PORT

- A. No personal liability. Officers, employees, and representatives of the Port, including the Commissioners, acting within the scope of their employment, shall not be personally liable to Contractor for any acts or omissions arising out of the Project.

ARTICLE 3 - CONTRACTOR'S RESPONSIBILITIES

3.01 DUTY TO PERFORM THE ENTIRE WORK

- A. Contractor must perform entire Work in accordance with Contract Documents. The Contractor shall perform the entire Work required by the Contract in accordance with the Contract Documents. Unless otherwise specifically provided, the Contractor shall provide and pay for all labor, tools, equipment, materials, electricity, power, water, other utilities, transportation and other facilities necessary for the execution and completion of the Work.
- B. Contractor shall be independent contractor. The Contractor shall be and operate as an independent contractor in the performance of the Work. The Contractor is not authorized to enter into any agreements or undertakings for or on behalf of the Port and is not an agent or employee of the Port.

3.02 OBSERVED ERRORS, INCONSISTENCIES, OMISSIONS OR VARIANCES IN THE CONTRACT DOCUMENTS

- A. Contractor to notify Port of any discrepancy. The Contractor's obligations to review and carefully study the Contract Documents and field conditions are for the purpose of facilitating coordination and construction. If the Contractor at any time observes that the Contract Documents, including Drawings and Specifications, vary from the conditions of the Project site, are in error, or omit any necessary detail, the Contractor shall promptly notify the Engineer in writing through a Request for Information. Any Work done after such observation, until authorized by the Engineer, shall be at Contractor's risk. The Contractor shall also promptly report to the Engineer any observed error, inconsistency, omission, or variance with applicable laws through a Request for Information. If the Contractor fails either to carefully study and compare the Contract Documents, or to promptly report any observed error, inconsistency,

omission, or variance, the Contractor shall assume full responsibility and shall bear all costs, liabilities and damages attributable to the error, inconsistency, omission, or variance.

- B. Requests for Information. The Contractor shall submit Requests for Information concerning the Contract Documents by following the procedure and using such form as the Port may require. The Contractor shall minimize Requests for Information by thoroughly studying the Contract Documents and reviewing all Subcontractor requests. The Contractor shall allow adequate time in its planning and scheduling for a response from the Port to a Request for Information.
- C. Port may provide information to supplement Drawings and Specifications. Minor items of work or detail that are omitted from the Drawings and Specifications but inferable from the information presented and normally provided by accepted good practice shall be provided and/or performed by the Contractor as part of the Contract Sum and within the Contract Time. Similarly, the Engineer may furnish to the Contractor additional Drawings and clarifications, consistent with the Contract Documents, as necessary to detail and illustrate the Work. The Contractor shall conform its Work to such additional Drawings and clarifications at no increase in the Contract Sum or Contract Time.

3.03 SUPERVISION AND RESPONSIBILITY FOR SUBCONTRACTORS

- A. Contractor responsible for Work and workers. The Contractor shall have complete control of the means, methods, techniques, sequences or procedures related to the Work, and for all safety precautions or programs. The Contractor shall have complete control over and responsibility for all personnel performing the Work. The Contractor is also responsible for the acts and omissions of the Contractor's principals, employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors of any tier.
- B. Contractor to supervise the Work. The Contractor shall continuously supervise and direct the Work using competent and skilled personnel and the Contractor's best skill and attention.
- C. Contractor to enforce discipline and good order. The Contractor shall enforce strict discipline and good order among all workers on the Project, and shall not employ any unfit person or anyone not skilled in the work to which they are assigned. Incompetent, careless, or negligent workers shall immediately be removed from the Work. The Port may, but is not obligated to, require the Contractor to remove from the Work, at no change in the Contract Sum or Contract Time, anyone whom the Port considers objectionable.

3.04 MATERIALS AND EQUIPMENT

- A. Material and equipment to be new. All materials and equipment to be incorporated into the Work shall be new unless specifically provided otherwise in the Contract Documents. The Contractor shall, if required in writing by the Port, furnish satisfactory evidence regarding the kind and quality of any materials, identify the source, and warrant compliance with the Contract Documents. The Contractor shall ensure that all materials and equipment are protected, kept dry and stored under cover in a manner to protect such materials and equipment.
- B. Material and equipment shall conform to manufacturer instructions. All materials and equipment shall conform, and shall be applied, installed, used, maintained and conditioned in accordance with, the instructions of the applicable manufacturer, fabricator or processor, unless otherwise specifically provided by the Engineer.

3.05 CONTRACTOR WARRANTIES

- A. Work will be of good quality and performed in workmanlike manner. In addition to any specific warranties set forth in the Contract Documents, the Contractor warrants that the Work, including all materials and equipment furnished under the Contract, will be of good quality and

new, will be performed in a skillful and workmanlike manner and will conform to the requirements of the Contract Documents. Any Work not conforming to this warranty, including unapproved or unauthorized substitutions, shall be considered defective.

- B. Work will be free from defects. The Contractor warrants that the Work will be free from defects for a period of one (1) year from the date of Substantial Completion of the Project.
- C. Contractor to collect and deliver warranties to Port. The Contractor shall collect and deliver to the Port any written warranties required by the Contract Documents. These warranties shall be obtained and enforced by the Contractor for the benefit of the Port without the necessity of separate assignment. These warranties shall extend to the Port all rights, claims, benefits and interests that the Contractor may have under express or implied warranties or guarantees against a Subcontractor of any tier, supplier or manufacturer for defective or non-conforming Work. Warranty provisions that purport to limit or alter the Port's rights under the Contract Documents or the laws of the State of Washington are null and void.
- D. General requirements. The Contractor is not relieved of its general warranty obligations by the specification of a particular product or procedure in the Contract Documents. Warranties in the Contract Documents shall survive completion, acceptance and final payment.

3.06 REQUIRED WAGES

- A. Contractor will pay required wages. The Contractor shall pay (and shall ensure that all Subcontractors of any tier pay) all prevailing wages and other wages (such as Davis-Bacon Act wages) applicable to the Project. See Specification Section 00 73 46.
- B. The Contractor shall defend (at Contractor's sole cost, with legal counsel approved by Port), indemnify and hold the Port harmless from all liabilities, obligations, claims, demands, damages, disbursements, lawsuits, losses, fines, penalties, costs and expenses, whether direct or indirect, and including but not limited to attorneys' fees and consultants' fees and other costs and expenses of litigation, from any violation or alleged violation by the Contractor or any Subcontractor of any tier of RCW 39.12 ("Prevailing Wages on Public Works") or Chapter 51 RCW ("Industrial Insurance").

3.07 STATE AND LOCAL TAXES

- A. Contractor will pay taxes on consumables. The Contractor will pay the retail sales tax on all consumables used during performance of the Work and on all items that are not incorporated into the final Work; this tax shall be included in the Contract Sum.
- B. Port will pay taxes on the Contract Sum. The Port will pay state and local retail sales tax on the Contract Sum with each progress payment and on final payment for transmittal by the Contractor to the Washington State Department of Revenue or to the applicable local taxing authority. Rule 170: WAC 458-20-170.
- C. Direct all tax questions to the Department of Revenue. The Contractor should direct all questions concerning taxes on any portion of the Work to the State of Washington Department of Revenue or to the local taxing authority.
- D. State Sales Tax - Rule 171: WAC 458-20-171. For work performed related to building, repairing, or improving streets, roads, etc., which are owned by a municipal corporation, or political subdivision of the state, or by the United States, and which are used, primarily, for foot or vehicular traffic, the Contractor shall include Washington State Retail Sales Taxes in the various schedule prices, or other contract amounts, including those that the Contractor pays on the purchase of materials, equipment, or supplies used or consumed in doing the Work.

1. The bid form will indicate which bid items are subject to Rule 171. Any such identification by the Port is not binding upon the Department of Revenue.

3.08 PERMITS, LICENSES, FEES, AND ROYALTIES

- A. Contractor to provide and pay for permits unless otherwise specified. Unless otherwise specified, the Contractor shall procure and pay for all permits, licenses, and governmental inspection fees necessary or incidental to the performance of the Work. All costs related to these permits, licenses, and inspections shall be included in the Contract Sum. Any action taken by the Port to assist the Contractor in obtaining permits or licenses shall not relieve the Contractor of its sole responsibility to obtain and pay for permits, licenses, and inspections as part of the Contract Sum.
- B. Contractor's obligations when permit must be in Port's name. When applicable law or agency requires a permit to be issued to a public agency, the Port will support the Contractor's request for the permit and accept the permit in the Port's name, if:
 1. The Contractor takes all necessary steps required for the permit to be issued;
 2. The permit applies to Work performed in connection with the Project; and
 3. The Contractor agrees in writing to abide by all requirements of the permit and to defend and hold harmless the Port from any liability in connection with the permit.
- C. Contractor to pay royalties. The Contractor shall pay all royalties and license fees required for the Work unless otherwise specified in the Contract Documents.

3.09 SAFETY

- A. Contractor solely responsible for safety. The Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work and the performance of the Contract.
- B. Port not responsible for safety. The Port may identify safety concerns to the Contractor. However, no action or inaction of the Port or any third party relating to safety will: (1) relieve the Contractor of its sole and complete responsibility for safety and sole liability for any consequences; (2) impose any obligation on the Port or a third party to inspect or review the Contractor's safety program or precautions; (3) impose any continuing obligation on the Port or a third party to ensure the Contractor performs the Work safely; or (4) affect the Contractor's responsibility for the protection of property, workers, and the general public.
- C. Contractor to maintain a safe Work site. The Project site may be occupied during performance of the Work. The safety of these site occupants is of paramount importance to the Port. The Contractor shall maintain the Work site and perform the Work in a safe manner and in accordance with the Washington Industrial Safety and Health Act (WISHA) and all other applicable safety laws, rules, and regulations. This requirement shall apply continuously and not be limited to working hours.
- D. Contractor to protect Work site and adjacent property until Final Completion. The Contractor shall continuously protect the Work and adjacent property from damage. At all times until Final Completion, the Contractor shall be responsible for and protect from damage, weather, deterioration, theft, and vandalism the Work and all materials, equipment, tools, and other items incorporated or to be incorporated in the Work, and shall repair any damage, injury or loss.

3.10 CORRECTION OF WORK

- A. Contractor to correct defective Work. The Contractor shall, at no cost to the Port, promptly correct Work that is defective or that otherwise fails to conform to the requirements of the Contract Documents. Such Work shall be corrected, whether before or after Substantial Completion, and even if it was previously inspected or observed by the Port.
- B. One-year correction period. The Contractor shall correct all defects in the Work appearing within one (1) year of Substantial Completion or within any longer period prescribed by law or by the Contract Documents. The Contractor shall initiate remedial action within fourteen (14) days of receipt of notice from the Port and shall complete remedial work within a reasonable time. Work corrected by the Contractor shall be subject to the provisions of this Section 3.10 for an additional one-year period following the Port's acceptance of the corrected Work.
- C. Contractor responsible for defects and failures to correct. The Contractor shall be responsible for any expenses incurred by the Port resulting from defects in the Work. If the Contractor refuses or neglects to correct the defects or does not timely accomplish corrections, the Port may correct the Work and charge the Contractor the cost of the corrections. If damage or loss of service may result from a delay in correction, the corrections may be made by the Port and reimbursed by the Contractor.
- D. Port may accept defective work. The Port may, at its sole option, elect to retain defective or nonconforming Work. In such a case, the Port shall reduce the Contract Sum by a reasonable amount to account for the defect or non-conformance.
- E. No period of limitation established. Nothing contained in this Section 3.10 establishes a period of limitation with respect to any obligations under the Contract Documents or law. The establishment of the one (1) year correction period relates only to the specific obligation of the Contractor to correct defective or non-conforming Work.

3.11 UNCOVERING OF WORK

- A. Contractor to uncover work covered prior to inspection. If any portion of the Work is covered prior to inspection and approval, the Contractor shall, at its expense, uncover or remove the Work for inspection by the Port or others, and replace the Work to the standard required by the Contract Documents.
- B. Contractor to uncover work at Port's request. After initial inspection and observation, the Port may order a reexamination of Work, and the Work must be uncovered by the Contractor. If the uncovered Work complies with the Contract Documents, the Port shall pay the cost of reexamination and replacement. If the Work is found not to comply with the Contract Documents, the Contractor shall pay the cost of replacement unless the Contractor demonstrates that it did not cause the defect in the Work.

3.12 RELOCATION OF UTILITIES

- A. Contractor should assume underground utilities are in approximate locations. The Contractor should assume that the locations of any underground or hidden utilities, underground tanks, and plumbing or electrical runs indicated in surveys or the Contract Documents are shown in approximate locations. The accuracy of this information is not guaranteed by the Port and shall be verified by the Contractor. The Contractor shall comply with RCW 19.122.030 and utilize a utility locator service to locate utilities on Port property. The Contractor shall bear the risk of loss if any of its Work directly or indirectly damages or interrupts any utility service or causes or contributes to damages of any nature.

- B. Utility relocation or removal. Where relocation or removal of utilities is necessary or required, it shall be performed at the Contractor's sole expense, unless the Contract Documents specify otherwise. If a utility owner is identified as being responsible for relocating or removing utilities, the work will be accomplished at the utility owner's convenience, either during or in advance of construction. Unless otherwise specified, it shall be the Contractor's sole responsibility to coordinate, schedule, and pay for work performed by a utility owner.
- C. Contractor to notify Port of unknown utilities. If the Contractor discovers the presence of any unknown utilities, it shall immediately notify the Engineer in writing.

3.13 LABOR

- A. Contractor responsible for labor peace. The Contractor is responsible for labor peace relating to the Work and shall cooperate in maintaining Project-wide labor harmony. The Contractor shall use its best efforts as an experienced contractor to adopt and implement policies and practices designed to avoid work stoppages, slowdowns, disputes or strikes.
- B. Contractor to minimize impact of labor disputes. The Contractor will take all necessary steps to prevent labor disputes from disrupting or otherwise interfering with access to Port property. If a labor dispute disrupts the progress of the Work or interferes with access, the Contractor shall promptly and expeditiously take all necessary action to eliminate or minimize the disruption or interference.

3.14 INDEMNIFICATION

- A. Duty to defend, indemnify, and hold harmless. To the fullest extent permitted by law and subject to this Section 3.14, the Contractor shall defend (at the Contractor's sole cost, with legal counsel approved by Port), indemnify and hold harmless the Port, including its Commission, officers, managers, employees (including the Engineer), any consultants, and the agents and employees, successors and assigns of any of them (the "Indemnified Parties") from and against claims, damages, lawsuits, losses (including loss of use), disbursements, liabilities, obligations, fines, penalties, costs and expenses, whether direct and indirect or consequential, including but not limited to consultants' fees, and attorneys' fees incurred on such claims and in proving the right to indemnification ("Claims"), arising out of or resulting from the acts or omissions of the Contractor, a Subcontractor of any tier, their agents and anyone directly or indirectly employed by any of them or anyone for whose acts they may be liable (individually and collectively, the "Indemnitor").
- B. Duty to defend, indemnify, and hold harmless for sole negligence. The Contractor will fully defend, indemnify, and hold harmless the Indemnified Parties for the sole negligence or willful misconduct of the Indemnitor.
- C. Duty to defend, indemnify, and hold harmless for concurrent negligence. Where Claims arise from the concurrent negligence of (1) the Port and (2) the Indemnitor, the Contractor's obligations to indemnify and defend the Indemnified Parties under this Section 3.14 shall be effective only to the extent of the Indemnitor's negligence.
- D. Duty to indemnify not limited by workers' compensation or similar employee benefit acts. In claims against any of the Indemnified Parties by an employee of the Contractor, a Subcontractor of any tier, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under this Section 3.14 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable under workers' compensation acts, disability benefit acts or other employee benefit acts. After mutual negotiation of the parties, the Contractor waives immunity as to the Indemnified Parties under Title 51 RCW, "Industrial Insurance."

- E. Intellectual property indemnification. The Contractor will be liable for and shall defend (at the Contractor's sole cost, with legal counsel approved by Port) indemnify and hold the Indemnified Parties harmless for Claims for infringement by the Contractor of copyrights or patent rights arising out of or relating to the Project.
- F. Labor peace indemnification. If the Contractor fails to satisfy its labor peace obligations under the Contract, the Contractor will be liable for and shall defend (at the Contractor's sole cost, with legal counsel approved by Port), indemnify and hold harmless the Indemnified Parties for Claims brought against the Port by third parties (including but not limited to lessees, tenants, contractors, customers, licensees and invitees of the Port) for injunctive relief or monetary loss.
- G. Joinder. The Contractor agrees to being added by the Port as a party to any arbitration or litigation with third parties in which the Port alleges indemnification or seeks contribution from the Indemnitor. The Contractor shall cause each of its Subcontractors of any tier to similarly stipulate in their subcontracts; in the event any does not, the Contractor shall be liable in place of such Subcontractor(s) of any tier.
- H. Other. To the extent that any portion of this Section 3.14 is stricken by a court or arbitrator for any reason, all remaining provisions shall retain their vitality and effect. The obligations of the Contractor under this Section 3.14 shall not be construed to negate, abridge, or otherwise reduce any other right or obligations of indemnity which would otherwise exist. To the extent the wording of this Section 3.14 would reduce or eliminate an available insurance coverage, it shall be considered modified to the extent necessary so that the insurance coverage is not affected. This Section 3.14 shall survive completion, acceptance, final payment and termination of the Contract.

3.15 WAIVER OF CONSEQUENTIAL DAMAGES

- A. Mutual waiver of consequential damages. The Contractor and Port waive claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes but is not limited to: (1) damages incurred by the Port for rental expenses, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and (2) damages incurred by the Contractor for principal and home office overhead and expenses including but not limited to the compensation of personnel stationed there, for losses of financing, business and reputation, for losses on other projects, for loss of profit, and for interest or financing costs. This mutual waiver includes but is not limited to all consequential damages due to either party's termination.
- B. Limitation. Nothing contained in this Section 3.15, however, shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents, to preclude damages specified in the Agreement or to affect the Contractor's obligation to indemnify the Port for direct, indirect or consequential damages alleged by a third party.

ARTICLE 4 - SUBCONTRACTORS AND SUPPLIERS

4.01 RESPONSIBILITY FOR ACTIONS OF SUBCONTRACTORS AND SUPPLIERS.

- A. Contractor responsible for Subcontractors. The Contractor is fully responsible to the Port for the acts and omissions of its Subcontractors of any tier and all persons either directly or indirectly employed by the Contractor or its Subcontractors.

4.02 AWARD OF CONTRACTS TO SUBCONTRACTORS AND SUPPLIERS

- A. Contractor to provide proposed Subcontractor information. The Contractor, within ten (10) days after the Port's notice of award of the Contract, shall provide to the Engineer with the

names of the persons or entities proposed to perform each of the principal portions of the Work (i.e., either a Subcontractor listed in a bid or proposal or a Subcontractor performing Work valued at least ten percent (10%) of the Contract Sum) and the proprietary names and the suppliers of the principal items or systems of materials and equipment proposed for the Work. No progress payment will become due until after this information has been furnished.

- B. Port to respond promptly with objections. The Port may respond promptly to the Contractor in writing stating (1) whether the Port has reasonable objection to any proposed person or entity or (2) whether the Port requires additional time for review. If the Port makes a reasonable objection, the Contractor shall replace the Subcontractor with no increase to the Contract Sum or Contract Time. Such a replacement shall not relieve the Contractor of its responsibility for the performance of the Work and compliance with all of the requirements of the Contract within the Contract Sum and Contract Time.
- C. Reasonable objection defined. "Reasonable objection" as used in this Section 4.02 includes but is not limited to: (1) a proposed Subcontractor of any tier different from the entity listed with the bid, (2) lack of "responsibility" of the proposed Subcontractor, as defined by Washington law and the Bidding Documents, or lack of qualification or responsibility of the proposed Subcontractor based on the Contract or Bidding Documents, or (3) failure of the Subcontractor to perform satisfactorily in the Port's opinion (such as causing a material delay or submitting a claim that the Port considers inappropriate) on one or more projects for the Port within five (5) years of the bid date.
- D. No substitution allowed without permission. The Contractor shall not substitute a Subcontractor, person, or organization without the Engineer's written consent.

4.03 SUBCONTRACTOR AND SUPPLIER RELATIONS

- A. Contractor to schedule, supervise, and coordinate Subcontractors. The Contractor shall schedule, supervise and coordinate the operations of all Subcontractors of any tier, including suppliers. The Contractor shall ensure that appropriate Subcontractors coordinate the Work of lower-tier Subcontractors.
- B. Subcontractors to be bound to Contract Documents. By appropriate agreement, the Contractor shall require each Subcontractor and supplier to be bound to the terms of the Contract Documents and to assume toward the Contractor, to the extent of their Work, all of the obligations that the Contractor assumes toward the Port under the Contract Documents. Each subcontract shall preserve and protect the rights of the Port and shall allow to the Subcontractor, unless specifically provided in the subcontract, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Port. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with lower-tier Subcontractors.
- C. Contractor to correct deficiencies in Subcontractor performance. When a portion of the Work subcontracted by the Contractor is not being prosecuted in accordance with the Contract Documents, or if such subcontracted Work is otherwise being performed in an unsatisfactory manner in the Port's opinion, the Contractor shall, on its own initiative or upon the written request of the Port, take immediate steps to correct the deficiency or remove the non-performing party from the Project. The Contractor shall replace inadequately performing Subcontractors upon request of the Port at no change in the Contract Sum or Contract Time.
- D. Contractor to provide subcontracts. Upon request, the Contractor will provide the Port copies of written agreements between the Contractor and any Subcontractor.

ARTICLE 5 - WORKFORCE AND NON-DISCRIMINATION REQUIREMENTS

5.01 COMPLIANCE WITH NON-DISCRIMINATION LAWS

- A. Contractor to comply with non-discrimination laws. The Contractor shall fully comply with all applicable laws, regulations, and ordinances pertaining to non-discrimination.

5.02 SMALL BUSINESS ENTERPRISE PARTICIPATION.

- A. Small business participation encouraged. The Port's policy is to encourage the Contractor to solicit and document participation, and to provide and promote the maximum lawful, practicable opportunity for increased participation, by small business enterprises.

ARTICLE 6 - CONTRACT TIME AND COMPLETION

6.01 CONTRACT TIME

- A. Contract Time is measured from Contract execution. Unless otherwise provided in the Agreement, the Contract Time is the period of time, including authorized adjustments, specified in the Contract Documents from the date the Contract is executed to the date Substantial Completion of the Work is achieved.
- B. Commencement of the Work. The Contractor shall begin Work in accordance with the notice of award and the notice to proceed and shall complete all Work within the Contract Time. When the Contractor's signed Agreement, required insurance certificate with endorsements, bonds and other submittals required by the notice of award have been accepted by the Port, the Port will execute the Contract and, following receipt of other required pre-work submittals, will issue a notice to proceed to allow the Contractor to mobilize and commence physical Work at the Project site, as further described in these contract documents. No Work at the Project site may commence until the Port issues a notice to proceed.
- C. Contractor shall achieve specified completion dates. The Contractor shall achieve Substantial Completion within the Contract Time and shall achieve Final Completion within the time period thereafter stated in the Contract Documents.
- D. Time is of the essence. Time limits stated in the Contract Documents, including any interim milestones, are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

6.02 PROGRESS AND COMPLETION

- A. Contractor to maintain schedule. The Contractor's sequence and method of operations, application of effort, and work force shall at all times be created and implemented to ensure the orderly, expeditious, and timely completion of the Work and performance of the Contract. The Contractor shall furnish sufficient forces and shall work such hours, including extra shifts, overtime operations and weekend and holiday work as may be necessary to ensure completion of the Work within the Contract Time and the approved Progress Schedule.
- B. Contractor to take necessary steps to meet schedule. If the Contractor fails substantially to perform in a timely manner in accordance with the Contract Documents and, through the fault of the Contractor or Subcontractor(s) of any tier, fails to meet the Progress Schedule, the Contractor shall take such steps as may be necessary to immediately improve its progress by increasing the number of workers, shifts, overtime operations or days of work, or by other means and methods, all without additional cost to the Port. If the Contractor believes that any action or inaction of the Port constitutes acceleration, the Contractor shall immediately notify the Port in writing and shall not accelerate the Work until the Port either directs the acceleration in writing or denies the constructive acceleration.

- C. Liquidated damages not exclusive. Any provisions in the Contract Documents for liquidated damages shall not preclude other damages due to breaches of Contract of the Contractor.

6.03 SUBSTANTIAL COMPLETION

- A. Substantial Completion defined. Substantial Completion is the stage in the progress of the Work, or portion or phase thereof, when the Work or designated portion is sufficiently complete in accordance with the Contract Documents so that the Port can fully occupy or utilize the Work, or the designated portion thereof, for its intended use, all requirements in the Contract Documents for Substantial Completion have been achieved, and all required documentation has been properly submitted to the Port in accordance with the Contract Documents. All Work other than incidental corrective or punch list Work and final cleaning must be completed. The fact that the Port may occupy the Work or a designated portion thereof does not indicate that Substantial Completion has occurred or that the Work is acceptable in whole or in part.
- B. Work not Substantially Complete unless Final Completion attainable. The Work is not Substantially Complete unless the Port reasonably judges that the Work can achieve Final Completion within the period of time specified in the Contract Documents.
- C. Notice of Substantial Completion. When the Work or designated portion has achieved Substantial Completion, the Port will provide a notice to establish the date of Substantial Completion. The notice shall establish responsibilities of the Port and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all remaining Work. If the notice of Substantial Completion does not so state, all responsibility for the foregoing items shall remain with the Contractor until Final Completion.

6.04 COMPLETION OF PUNCH LIST

- A. Contractor shall complete punch list items prior to Final Completion. The Contractor shall cause punch list items to be completed prior to Final Completion. If, after Substantial Completion, the Contractor does not expeditiously proceed to correct punch list items or if the Port considers that the punch list items are unlikely to be completed prior to the date established for Final Completion (or such other period of time as is specified in the Contract Documents), the Port may, upon seven (7) days' written notice to the Contractor, take over and perform some or all of the punch list items. The Port may also take over and complete any portion of the Work at any time following Substantial Completion and deduct the actual cost of performing the Work (including direct and indirect costs) from the Contract Sum. The Port's rights under this Section 6.04 are not obligations and shall not relieve the Contractor of its responsibilities under any other provisions of the Contract Documents.

6.05 FINAL COMPLETION

- A. Final Completion. Upon receipt of written notice from the Contractor that all punch list items and other Contract requirements are completed, the Contractor will notify the Port, and the Port will perform a final inspection. If the Port determines that some or all of the punch list items have not been addressed, the Contractor shall be responsible to the Port for all costs, including re-inspection fees, for any subsequent reviews to determine completion of the punch list. When the Port determines that all punch list items have been satisfactorily addressed, that the Work is acceptable under the Contract Documents and that the Work has fully been performed, the Port will promptly notify the Contractor of Final Completion.
- B. Contractor responsible for costs if Final Completion is not timely achieved. In addition to any liquidated damages, the Contractor is liable for, and the Port may deduct from any amounts due the Contractor, all costs incurred by the Port for services performed after the contractual

date of Final Completion, whether or not those services would have been performed prior to that date had Final Completion been timely achieved.

- C. Final Completion submittals. The Port is not obligated to accept the Project as complete until the Contractor has submitted all required submittals to the Port.
- D. Contractor responsible for the Work until Final Completion. The Contractor shall assume the sole risk of loss and responsibility for all Work under the Contract, and all materials to be incorporated in the Work, whether in storage or at the Project site, until Final Completion. Damage from any cause to either permanent or temporary Work, utilities, materials, equipment, existing structures, the site, or other property owned by the Port or others, shall be repaired by the Contractor to the reasonable satisfaction of the Port at no change in the Contract Sum.

6.06 FINAL ACCEPTANCE

- A. Final Acceptance. Final Acceptance is the formal action of the Port accepting the Project as complete. Public notification of Final Acceptance will be posted on the Port's external website (<<http://www.portoftacoma.com/final-acceptance>>).
- B. Final Acceptance not an acceptance of defective Work. Final Acceptance shall not constitute acceptance by the Port of unauthorized or defective Work, and the Port shall not be prevented from requiring the Contractor to remove, replace, repair, or dispose of unauthorized or defective Work or recovering damages due to the same.
- C. Completion of Work under RCW 60.28. Pursuant to RCW 60.28, "Lien for Labor, Materials, Taxes on Public Works," completion of the Contract Work shall occur upon Final Acceptance.

6.07 PORT'S RIGHT TO USE THE PREMISES

- A. Port has right to use and occupy Work. The Port reserves the right to occupy or use any part of the Work before or after Substantial Completion of some or all of the Work without relieving the Contractor of any of its obligations under the Contract. Such occupancy or use shall not constitute acceptance by the Port of any of the Work, and shall not cause any insurance to be canceled or lapse.
- B. No compensation due if Port elects to use and occupy Work. No additional compensation shall be due to the Contractor as a result of the Port's use or occupancy of the Work or a designated portion.

ARTICLE 7 - PAYMENT

7.01 ALL PAYMENTS SUBJECT TO APPLICABLE LAWS AND SCHEDULE OF VALUES

- A. Payment of the Contract Sum. The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Port to the Contractor for performance of the Work under the Contract Documents. Payments made to the Contractor are subject to all laws applicable to the Port and the Contractor. Payment of the Contract Sum constitutes full compensation to the Contractor for performance of the Work, including all risk, loss, damages, or expense of whatever character arising out of the nature or prosecution of the Work. The Port is not obligated to pay for extra work or materials furnished without prior written approval of the Port.
- B. Schedule of Values. All payments will be based upon an approved Schedule of Values. Prior to submitting its first Application for Payment, the Contractor shall submit a Schedule of Values to the Port allocating the entire Contract Sum to the various portions of the Work. The Schedule of Values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Port may require. This schedule, unless objected to by the Port, shall be used as a basis for reviewing the Contractor's applications for payment.

7.02 APPLICATIONS FOR PAYMENT

- A. Applications for Payment. Progress payments will be made monthly for Work duly certified, approved by the Engineer, and performed (based on the Schedule of Values and actual quantities of Work performed) during the calendar month preceding the Application for Payment. These amounts are paid in trust to the Contractor for distribution to Subcontractors to the extent and in accordance with the approved Application for Payment.

7.03 PROGRESS PAYMENTS

- A. Progress payments. Following receipt of a complete Application for Payment, the Engineer will either authorize payment or indicate in writing to the Contractor the specific reasons why the payment request is being denied, in whole or in part, and the remedial action the Contractor must take to receive the withheld amount. After a complete Application for Payment has been received and approved by the Port, payment will be made within thirty (30) days. Any payments made by, or through, or following receipt of payment from third parties will be made in accordance with the third party's policies and procedures.
- B. Port may withhold payment. The Port may withhold payment in whole or in part as provided in the Contract Documents or to the extent reasonably necessary to protect the Port from loss or potential loss for which the Contractor is responsible, including loss resulting from the Contractor's acts and omissions.

7.04 PAYMENT BY CONTRACTOR TO SUBCONTRACTORS

- A. Payment to Subcontractors. With each Application for Payment, the Contractor shall provide a list of Subcontractors to be paid by the Contractor. No payment request shall include amounts the Contractor does not intend to pay to a Subcontractor because of a dispute or other reason. If, however, after submitting an Application for Payment but before paying a Subcontractor, the Contractor discovers that part or all of a payment otherwise due to the Subcontractor is subject to withholding from the Subcontractor under the subcontract (such as for unsatisfactory performance or non-payment of lower-tier Subcontractors), the Contractor may withhold the amount as allowed under the subcontract, but it shall give the Subcontractor and the Port written notice of the remedial actions that must be taken and pay the Subcontractor within eight (8) working days after the Subcontractor satisfactorily completes the remedial action identified in the notice.
- B. Payment certification to be provided upon request. The Contractor shall provide with each Application for Payment a certification signed by Contractor attesting that all payments by the Contractor to Subcontractors from the last Application for Payment were made within ten (10) days of the Contractor's receipt of payment. The certification will also attest that the Contractor will make payment to Subcontractors for the current Application for Payment within ten (10) days of receipt of payment from the Port.

7.05 FINAL PAYMENT

- A. Final payment. Final applications for payment are due within seven (7) days following Final Completion. Final payment of the unpaid balance of the Contract Sum, except retainage, will be made following Final Completion and within thirty (30) days of the Contractor's submission of an approved final Application for Payment.
- B. Releases required for final payment. The final payment shall not become due until the Contractor delivers to the Port a complete release of all liens arising out of the Contract, as well as an affidavit stating that, to the best of Contractor's knowledge, its release includes all labor and materials for which a lien could be filed. If a Subcontractor of any tier refuses to furnish a release or waiver required by the Port, the Port may (a) retain in the fund, account, or

escrow funds in such amount as to defray the cost of foreclosing the liens of such claims and to pay attorneys' fees, the total of which shall be no less than 150% of the claimed amount, or (b) accept a bond from the Contractor, satisfactory to the Port, to indemnify the Port against the lien. If any such lien remains unsatisfied after all payments from the retainage are made, the Contractor shall refund to the Port all moneys that the Port may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

- C. Contractor to hold Port harmless from liens. The Contractor shall defend (at the Contractor's sole cost, with legal counsel approved by Port), indemnify, and hold harmless the Port from any liens, claims, demands, lawsuits, losses, damages, disbursements, liabilities, obligations, fines, penalties, costs and expenses, whether direct, indirect, including but not limited to attorneys' fees and consultants' fees and other costs and expenses, except to the extent a lien has been filed because of the failure of the Port to make a contractually required payment.

7.06 RETAINAGE

- A. Retainage to be withheld. In accordance with RCW 60.28, a sum equal to five percent (5%) of each approved Application for Payment shall be retained. Prior to submitting its first Application for Payment, the Contractor shall exercise one of the options listed below:
1. Retained percentages will be retained by the Port in a fund; or
 2. Deposited by the Port in an interest-bearing account in a bank, mutual savings bank or savings and loan association; or
 3. Placed in escrow with a bank or trust company; or
 4. If the Contractor provides a bond in place of retainage, it shall be in an amount equal to 5% of the Contract Sum plus Change Orders. The retainage bond shall be based on the form furnished in Section 00 61 23 or otherwise acceptable to the Port and duly completed and signed by a licensed surety or sureties registered with the Washington State Insurance Commissioner and on the currently authorized insurance list published by the Washington State Insurance Commissioner. The surety or sureties must be rated at least A minus, FSC(6), or higher by A.M. Best Rating Guide and be authorized by the Federal Department of the Treasury. Attorneys-in-fact who sign the retainage bond must file with each bond a certified and effective Power of Attorney statement.
- B. Contractor may withhold retainage from Subcontractors. The Contractor or a Subcontractor may withhold not more than five percent (5%) retainage from the monies earned by any Subcontractor or lower-tier Subcontractor, provided that the Contractor pays interest to the Subcontractor at the same interest rate it receives from its reserved funds. If requested by the Port, the Contractor shall specify the amount of retainage and interest due a Subcontractor.
- C. Release of retainage. Retainage will be withheld and applied by the Port in a manner required by RCW 60.28 and released in accordance with the Contract Documents and statutory requirements. Release of the retainage will be processed in the ordinary course of business within sixty (60) days following Final Acceptance of the Work by the Port provided that no notice of lien has been given as provided in RCW 60.28, that no claims have been brought to the attention of the Port, that the Port has no claims under this Contract, and that release of retention has been duly authorized by the State. The following items must also be obtained prior to release of retainage: pursuant to RCW 60.28, a certificate from the Department of Revenue; pursuant to RCW 50.24, a certificate from the Department of Employment Security; and appropriate information from the Department of Labor and Industries including approved affidavits of wages paid for the Contractor and each subcontractor.

7.07 DISPUTED AMOUNTS

- A. Disputed amounts. If the Contractor believes it is entitled to payment for Work performed during the prior calendar month in addition to the agreed-upon amount, the Contractor may submit to the Port along with the approved Application for Payment, a separate written payment request specifying the exact additional amount claimed to be due, the category in the Schedule of Values to which the payment would apply, the specific Work for which additional payment is sought, and an explanation of why the Contractor believes additional payment is due.

7.08 EFFECT OF PAYMENT

- A. Payment does not relieve Contractor of obligations. Payment to the Contractor of progress payments or final payment does not relieve the Contractor from its responsibility for the Work or its responsibility to repair, replace, or otherwise make good defective Work, materials or equipment. Likewise, the making of a payment does not constitute a waiver of the Port's right to reject defective or non-conforming Work, materials, or equipment (even though they are covered by the payment), nor is it a waiver of any other rights of the Port.
- B. Acceptance of final payment waives claims. Acceptance of final payment by the Contractor, a Subcontractor of any tier or a supplier shall constitute a waiver of claims except those previously made in writing and identified as unsettled in Contractor's final Application for Payment.
- C. Execution of Change Order waives claims. The execution of a Change Order shall constitute a waiver of claims by the Contractor arising out of the Work to be performed or deleted pursuant to the Change Order, except as specifically described in the Change Order.

7.09 LIENS

- A. Contractor to discharge liens. The Contractor shall promptly pay (and secure the discharge of any liens asserted by) all persons properly furnishing labor, equipment, materials or other items in connection with the performance of the Work (including, but not limited to, any Subcontractors of any tier).

ARTICLE 8 - CHANGES IN THE WORK

8.01 CHANGES IN THE WORK

- A. Changes in the Work authorized. Without invalidating the Contract and without notice to the Contractor's surety, the Port may authorize changes in the Work after execution of the Contract, including changes in the Contract Sum or Contract Time. Changes shall occur solely by Change Order, Unilateral Change Directive, or Minor Change in Work. All changes in the Work are effective immediately and the Contractor shall proceed promptly to perform the change, unless otherwise provided in the Change Order or Directive.
- B. Changes in the Work Defined.
 - 1. A Change Order is a written instrument signed by the Port and Contractor stating their agreement to a change in the Work and the adjustment, if any, in the Contract Sum and/or Contract Time.
 - 2. A Unilateral Change Directive is a written instrument issued by the Port to transmit new or revised Drawings, issue additions or modifications to the Contract, furnish other direction and documents adjustment, if any, to the Contract Sum and/or Contract Time. A Unilateral Change Directive is signed only by the Port, without requiring the consent or signature of the Contractor.

3. A Minor Change in the Work is a written order from the Port directing a change that does not involve an adjustment to the Contract Sum or the Contract Time.
- C. Request for Proposal: At any time, the Port may issue a Proposal Request directing the Contractor to propose a change to the Contract Sum and/or Contract Time, if any, based on a proposed change in the Work. The Contractor shall submit a responsive Change Order proposal as soon as possible and no later than fourteen (14) days after receipt in which the Contractor specifies in good faith the extent to which the Contract Sum and/or Contract Time would change. All cost components shall be limited to the manner described in Section 8.02(B). If the Contractor fails to timely respond to a Proposal Request, the Port may issue the change as a Unilateral Change Directive.
1. Fixed price method is default for Contractor Change Order proposal. When the Port has requested that the Contractor submit a Change Order proposal, the Port may specify the basis on which the Contract Sum will be adjusted by the Contractor. The Engineer's preference, unless otherwise indicated, is for changes in the Work to be priced using Lump Sums or Unit Prices or on a time and material (Force Account) basis if unit pricing or lump sums cannot be negotiated or determined. In all instances, however, proposed changes shall include a not-to-exceed price for the change and shall be itemized for evaluation purposes in accordance with Section 8.02(B), as requested by the Engineer.
 2. The Port may accept or reject the Contractor's Change Order proposal, request further documentation, or negotiate acceptable terms with the Contractor. If The Port and Contractor reach agreement on the terms of any change in the Work, including any adjustment in the Contract Sum or Contract Time, such agreement shall be incorporated in a Change Order.
 3. The Change Order shall constitute full payment and final settlement of all claims for time and for direct, indirect, and consequential costs, including costs of delays, inconvenience, disruption of schedule, or loss of efficiency or productivity, related to any Work either covered or affected by the Change Order, or related to the events giving rise to the request for equitable adjustment. The Port may reject a proposal, in which case the Port may either not effectuate the change or issue a Unilateral Change Directive. The Port will not make payment to the Contractor for any work until that work has been incorporated into an executed Change Order.
- D. Unforeseen Conditions: If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or any soils reports made available by the Port to the Contractor or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall immediately provide oral notice to the Engineer before conditions are disturbed, followed within 24 hours by an initial written notice. The Contractor shall submit a detailed proposal no later than seven (7) days following discovery of differing site conditions. The Engineer will promptly investigate these conditions and, if the Engineer determines that they differ materially and cause an increase or decrease in the Contractor's cost or time required for, performance of any part of the Work, will establish a change in the Contract Sum or Contract Time, or both, consistent with the requirements of the Contract Documents. If the Contractor disputes the Engineer's determination, the Contractor may proceed as provided in the dispute resolution procedure (Article 11). No increase to the Contract Sum or the Contract Time shall be allowed if the Contractor does not comply with the contractual requirements or if the Contractor knew or reasonably should have known of the concealed conditions prior to executing the Contract.

- E. Proceed Immediately: Pending agreement on the terms of the Change Order or upon determination of a differing site condition as defined in 8.01(D), the Engineer may direct Contractor to proceed immediately with the change in the Work. Contractor shall not proceed with any change in the Work until it has obtained the Engineer's written approval and documentation of the following:
1. The scope of work
 2. An agreed upon maximum not-to-exceed amount
 3. The method of final cost determination
 4. Estimated time to complete the changed work.
 5. As a change in the Work is performed, unless the parties have signed a written Change Order to establish the cost of the change, the Contractor shall maintain an itemized accounting of all costs related to the change based on the categories in Section 8.02(B) and provide such data to the Port upon request. This includes, without limitation, invoices, including freight and express bills, and other support for all material, equipment, Subcontractor, and other charges related to the change and, for material furnished from the Contractor's own inventory, a sworn affidavit certifying the actual cost of such material. Failure to provide data to the Port within seven (7) days of a request constitutes a waiver of any claim. The Port may furnish any material or equipment to the Contractor that it deems advisable, and the Contractor shall have no claim for any costs or fee on such material or equipment.
- F. Procedure for Unilateral Change Directive. Whether or not the Port has rejected a Contractor's proposal, the Port may issue a Unilateral Change Directive and the Contractor shall promptly proceed with the specified Work. If the Contractor disagrees with a Unilateral Change Directive, the Contractor shall advise the Port in writing through a Change Order proposal within seven (7) days of receipt. The Contractor's Change Order proposal shall reasonably specify the reasons for any disagreement and the adjustment it proposes. Without this timely Change Order proposal, the Contractor shall conclusively be deemed to have accepted the Port's proposal.
- G. Payment pending final determination of Force Account work. Pending final determination of the total cost of Force Account Work, and provided that the Work to be performed under Force Account is complete and any reservations of rights have been signed by the Port, the Contractor may request payment for amounts not in dispute in the next Application for Payment accompanied by documentation indicating the parties' agreement. Work done on a Force Account basis must be approved in writing on a daily basis by the Engineer or the Engineer's designee and invoices shall be submitted with an Application for Payment within sixty (60) days of performance of the Work.

8.02 CHANGES IN THE CONTRACT SUM

- A. Port to Decide How Changes are Measured. The Port may elect, in its sole discretion, how changes in the Work will be measured for payment. Change in the Work may be priced on a lump sum basis, through Unit Prices, as Force Account, or by another method documented in the executed Change Order, Unilateral Change Directive or Minor Change in the Work.
- B. Determination of Cost of Change. The total cost of any change in the Work, including a claim under Article 11, shall not exceed the prevailing cost for the Work in the locality of the Project. In all circumstances, the change in the Work shall be limited to the reasonable, actual cost of the following components:

1. Direct labor costs: These are the actual labor costs determined by the number of additional craft hours at their normal hourly rate necessary to perform a change in the Work. The hourly cost of labor will be based upon the following:
 - a. Basic wages and fringe benefits: The hourly wage (without markup or labor burden) and fringe benefits paid by the Contractor as established by the Washington Department of Labor and Industries or contributed to labor trust funds as itemized fringe benefits, whichever is applicable, not to exceed that specified in the applicable "Intent to Pay Prevailing Wage," for the laborers, apprentices, journeymen, and foremen performing or directly supervising the change in the Work on site. These wages do not include the cost of Contractor's project manager or superintendent or above, and the premium portion of overtime wages is not included unless pre-approved in writing by the Port. Costs paid or incurred by the Contractor for vacations, per diem, subsistence, housing, travel, bonuses, stock options, or discretionary payments to employees are not separately reimbursable. The Contractor shall provide to the Port copies of payroll records, including certified payroll statements for itself and Subcontractors of any tier, upon the Port's request.
 - b. Workers' insurance: Direct contributions to the State of Washington as industrial insurance; medical aid; and supplemental pension by class and rates established by the Washington Department of Labor and Industries.
 - c. Federal insurance: Direct contributions required by the Federal Insurance Compensation Act (FICA); Federal Unemployment Tax Act (FUTA); and State Unemployment Compensation Act (SUCA).
2. Direct material costs: This is an itemization, including material invoices, of the quantity and actual cost of additional materials necessary to perform the change in the Work. The cost will be the net cost after all discounts or rebates, freight costs, express charges, or special delivery costs, when applicable. No lump sum costs will be allowed unless approved in advance by the Port.
3. Construction equipment usage costs: This is an itemization of the actual length of time that construction equipment necessary and appropriate for the Work is used solely on the changed Work times the applicable rental cost as established by the lower of the local prevailing rates published in www.equipmentwatch.com, as modified by the AGC/WSDOT agreement, or the actual rate paid to an unrelated third party. If more than one rate is applicable, the lowest available rate will be utilized. Rates and quantities of equipment rented that exceed the local fair market rental costs shall be subject to the Port's prior written approval. Total rental charges for equipment or tools shall not exceed 75% of the fair market purchase value of the equipment or the tool. Actual, reasonable mobilization costs are permitted if the equipment is brought to the site solely for the change in the Work. Mobilization and standby costs shall not be charged for equipment already present on the site.

The rates in effect at the time of the performance of the changed Work are the maximum rates allowable for equipment of modern design and in good working condition and include full compensation for furnishing all fuel, oil, lubrication, repairs, maintenance, and insurance. No gas surcharges are payable. Equipment not of modern design and/or not in good working condition will have lower rates. Hourly, weekly, and/or monthly rates, as appropriate, will be applied to yield the lowest total cost.
4. Subcontractor costs: These are payments the Contractor makes to Subcontractors for changed Work performed by Subcontractors. The Subcontractors' cost of changed Work

shall be determined in the same manner as prescribed in this Section 8.02 and, among other things, shall not include consultant costs, attorneys' fees, or claim preparation expenses.

5. Service provider costs: These are payments the Contractor makes to service providers for changed Work performed by service providers. The service providers' cost of changed Work shall be determined in the same manner as prescribed in this Section 8.02.
6. Markup: This is the maximum total amount for overhead, profit and other costs, including office, home office and site overhead (including purchasing, project manager, superintendent, project engineer, estimator, and their vehicles and clerical assistants), taxes (except for sales tax on the Contract Sum), warranty, safety costs, printing and copying, layout and control, quality control/assurance, small or hand tools (a tool that costs \$500 or less and is normally furnished by the performing contractor), preparation of as-built drawings, impact on unchanged Work, Change Order and/or claim preparation, and delay and impact costs of any kind (cumulative, ripple, or otherwise), added to the total cost to the Port of any Change Order work. No markup shall be due, however, for direct settlements of Subcontractor claims by the Port after Substantial Completion. The markup shall be limited in all cases to the following schedule:
 - a. Direct labor costs -- 20% markup on the direct cost of labor for the party (Contractor or Subcontractor) providing labor related to the change in the Work;
 - b. Direct material costs -- 20% markup on the direct cost of material for the party (Contractor or Subcontractor) providing material related to the change in the Work;
 - c. Construction equipment usage costs -- 10% markup on the direct cost of equipment for the party (Contractor or Subcontractor) providing equipment related to the change in the Work;
 - d. Contractor markup on Subcontractor costs -- 10% markup for the Contractor on the direct cost (excluding markup) of a change in the Work performed by Subcontractors (and for Subcontractors, for a change in the Work performed by lower-tier Subcontractors); and
 - e. Service provider costs -- 5% markup for the Contractor on the direct cost (excluding markup) of a change in the Work performed by service providers.

The total summed markup of the Contractor and all Subcontractors of any tier shall not exceed 30% of the direct costs of the change in the Work. If the markup would otherwise exceed 30%, the Contractor shall proportionately reduce the markup for the Contractor and all Subcontractors of any tier.

7. Cost of change in insurance or bond premium. This is defined as:
 - a. Contractor's liability insurance: The actual cost (expressed as a percentage submitted with the certificate of insurance provided under the Contract Documents and subject to audit) of the Contractor's liability insurance arising directly from the changed Work; and
 - b. Public works bond: The actual cost (expressed as a percentage submitted under the Contract Documents and subject to audit) of the Contractor's performance and payment bond arising directly from the changed Work.

Upon request, the Contractor shall provide the Port with supporting documentation from its insurer or surety of any associated cost incurred. The cost of the insurance or bond premium together shall not exceed 2.0% of the cost of the changed Work.

8. Unit Prices. If Unit Prices are specified in the Contract Documents or established by agreement of the parties for certain Work, the Port may apply them to the changed Work. Unit Prices shall include pre-agreed rates for material quantities and shall include reimbursement for all direct and indirect costs of the Work, including overhead, profit, bond, and insurance costs arising out of or related to the Unit Priced item. Quantities must be supported by field measurement statements signed by the Port, and the Port shall have access as necessary for quantity measurement. The Port shall not be responsible for not-to-exceed limit(s) without its prior written approval.

8.03 CHANGES IN THE CONTRACT TIME

- A. Extension of the Contract Time. If the Contractor is delayed at any time in the commencement or progress of the Work by events for which the Port is responsible, by unanticipated abnormal weather (subject to Section 8.03(E) below), or by other causes not the fault or responsibility of the Contractor that the Port determines may justify a delay in the Contract Time, then the Contract Time shall be extended by Change Order for such reasonable time as the Port may determine. In no event, however, shall the Contractor be entitled to any extension of time absent proof of (1) delay to an activity on the critical path of the Project, or (2) delay transforming an activity to the critical path, so as to actually delay the anticipated date of Substantial Completion.
- B. Allocation of responsibility for delay not caused by Port or Contractor. If a delay was not caused by the Port, the Contractor, or anyone acting on behalf of any of them, the Contractor is entitled only to an increase in the Contract Time but not an increase in the Contract Sum.
- C. Allocation of responsibility for delay caused by Port. If a delay was caused by the Port or someone acting on behalf of the Port and affected the critical path, the Contractor shall be entitled to a change in the Contract Time and Contract Sum in accordance with Section 8.02. The Contractor shall not recover damages, an equitable adjustment or an increase in the Contract Sum or Contract Time from the Port, however, where the Contractor could reasonably have avoided the delay. The Port is not obligated directly or indirectly for damages for any delay suffered by a Subcontractor of any tier that does not increase the Contract Time.
- D. Allocation of responsibility for delay caused by Contractor. If a delay was caused by the Contractor, a Subcontractor of any tier, or anyone acting on behalf of any of them, the Contractor is not entitled to an increase in the Contract Time or in the Contract Sum.
- E. Adverse weather. If adverse weather is identified as the basis for a claim for additional time, the claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not reasonably have been anticipated and had an adverse effect on the critical path of construction, and that the Work was on schedule (or not behind schedule through the fault of the Contractor) at the time the adverse weather conditions occurred. Neither the Contract Time nor the Contract Sum will be adjusted for normal inclement weather. For a claim based on adverse weather, the Contractor shall be eligible only for a change in the Contract Time (but not a change in the Contract Sum) if the Contractor can substantiate that there was significantly greater than normal inclement weather considering the full term of the Contract Time.
- F. Damages for delay. In the event the Contractor (including any Subcontractors of any tier) is held to be entitled to damages from the Port for delay beyond the amount permitted in Section 8.02(B), the total combined damages to the Contractor and any Subcontractors of any tier for each day of delay shall be limited to the same daily liquidated damage rate specified in the Contract Documents due the Port for the Contractor's delay in achieving Substantial

Completion. By submitting a bid on the Work and executing the Contract, the Contractor represents that these liquidated damages are a reasonable estimate of its loss.

- G. Limitation on damages. The Contractor shall not be entitled to damages arising out of loss of efficiency; morale, fatigue, attitude, or labor rhythm; constructive acceleration; home office overhead; expectant under run; trade stacking; reassignment of workers; rescheduling of Work, concurrent operations; dilution of supervision; learning curve; beneficial or joint occupancy; logistics; ripple; season change; extended or increased overhead or general conditions; profit upon damages for delay; impact damages including cumulative impacts; or similar damages. Any effect that such alleged costs may have upon the Contractor or its Subcontractors of any tier is fully compensated through the markup on Change Orders paid through Section 8.02(B) and any liquidated damages paid hereunder.

8.04 RESERVATION OF RIGHTS

- A. Reservations of rights void unless signed by Port. Reservations of rights will be deemed waived and are void unless any reserved rights are described in detail and are signed by the Contractor and the Port.
- B. Procedure for unsigned reservations of rights. If the Contractor adds a reservation of rights not signed by the Port to any Change Order, Unilateral Change Directive, Change Order proposal, Application for Payment or any other document, all amounts and all Work therein shall be considered disputed and not payable until costs are re-negotiated or the reservation is withdrawn or changed in a manner satisfactory to and signed by the Port. If the Port makes payment based on a document that contains a reservation of rights not signed by the Port, and if the Contractor cashes such payment, then the reservation of rights shall be deemed waived, withdrawn and of no effect.

8.05 UNIT PRICES

- A. Adjustment to Unit Prices. If Unit Prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed (less than eighty percent (80%) or more than one hundred and twenty percent (120%) of the quantity estimated) so that application of a Unit Price would be substantially unfair, the applicable Unit Price but not the Contract Time shall be adjusted if the Port prospectively approves a Change Order revising the Unit Price.
- B. Procedure to change Unit Prices. The Contractor or Port may request a Change Order revising a Unit Price by submitting information to support the change. A proposed change to a Unit Price will be evaluated by the Port based on the change in cost resulting solely from the change in quantity, any change in production rate or method as compared to the original plan, and the share, if any, of fixed expenses properly chargeable to the item. If the Port and Contractor agree on the change, a Change Order will be executed. If the parties cannot agree, the Contractor shall comply with the dispute resolution procedures (Article 11).

ARTICLE 9 - SUSPENSION AND TERMINATION OF CONTRACT

9.01 PORT'S RIGHT TO SUSPEND WORK

- A. Port may suspend the Work. The Port may at any time suspend the Work, or any part thereof, by giving notice to the Contractor. The Work shall be resumed by the Contractor as soon as possible, but no later than fourteen (14) days after the date fixed in a notice to resume the Work. The Port shall reimburse the Contractor for appropriate and reasonable expenses consistent with Section 8.02 incurred by the Contractor as a result of the suspension, except where a suspension is the result of the Contractor repeatedly or materially failing to carry out or

correct the Work in accordance with the Contract Documents, and the Contractor shall take all necessary steps to minimize expenses.

- B. Contractor obligations. During any suspension of Work, the Contractor shall take every precaution to prevent damage to, or deterioration of, the Work. The Contractor shall be responsible for all damage or deterioration to the Work during the period of suspension and shall, at its sole expense, correct or restore the Work to a condition acceptable to the Port prior to resuming Work.

9.02 TERMINATION OF CONTRACT FOR CAUSE BY THE PORT

- A. Port may terminate for cause. If the Contractor is adjudged bankrupt or makes a general assignment for the benefit of the Contractor's creditors, if a receiver is appointed due to the Contractor's insolvency, or if the Contractor, in the opinion of the Port, persistently or materially refuses or fails to supply enough properly skilled workmen or materials for proper completion of the Contract, fails to make prompt payment to Subcontractors or suppliers for material or labor, disregards laws, ordinances, or the instructions of the Port, fails to prosecute the Work continuously with promptness and diligence, or otherwise materially violates any provision of the Contract, then the Port, without prejudice to any other right or remedy, may terminate the Contractor after giving the Contractor seven (7) days' written notice (during which period the Contractor shall have the right to cure).
- B. Procedure following termination for cause. Following a termination for cause, the Port may take possession of the Project site and all materials and equipment, and utilize such materials and equipment to finish the Work. The Port may also exclude the Contractor from the Project site(s). If the Port elects to complete all or a portion of the Work, it may do so as it sees fit. The Port shall not be required to accept the lowest bid for completion of the Work and may choose to complete all or a portion of the Work using its own work force. If the Port elects to complete all or a portion of the Work, the Contractor shall not be entitled to any further payment until the Work is finished. If the expense of finishing the Work, including compensation for additional managerial and administrative services of the Port, exceeds the unpaid balance of the Contract Sum, the excess shall be paid by the Contractor.
- C. Port's remedies following termination for cause. The Port may exercise any rights, claims or demands that the Contractor may have against third persons in connection with the Contract, and for this purpose the Contractor assigns and transfers to the Port all such rights, claims and demands.
- D. Inadequate termination for cause converted to termination for convenience. If, after the Contractor has been terminated for cause, it is determined that inadequate "cause" for such termination exists, then the termination shall be considered a termination for convenience pursuant to Section 9.03.

9.03 TERMINATION OF CONTRACT FOR CONVENIENCE BY THE PORT

- A. Port may terminate for convenience. The Port may, at any time (without prejudice to any right or remedy of the Port), terminate all or any portion of the Contract for the Port's convenience and without cause. The Contractor shall be entitled to receive payment consistent with the Contract Documents only for Work properly executed through the date of termination, and costs necessarily incurred by reason of the termination (such as the cost of settling and paying claims arising out of the termination under subcontracts or orders), along with a fee of one percent (1%) of the Contract Sum not yet earned on the whole or part of the Work. The total amount to be paid to the Contractor shall not exceed the Contract Sum as reduced by the amount of payments otherwise made. The Port shall have title to all Work performed through the date of termination.

9.04 TERMINATION OF CONTRACT BY THE CONTRACTOR

- A. Contractor may terminate for cause. The Contractor may terminate the Contract if the Work is stopped for a period of sixty (60) consecutive days through no act or fault of the Contractor or a Subcontractor of any tier, for either of the following reasons:
 - 1. Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped; or
 - 2. An act of government, such as a declaration of national emergency that requires all Work to be stopped.
- B. Procedure for Contractor termination. If one of the reasons described in Section 9.04A exists, the Contractor may, upon seven (7) days' written notice to the Port (during which period the Port has the opportunity to cure), terminate the Contract and recover from the Port payment for Work executed through the date of termination in accordance with the Contract Documents and for proven loss with respect to materials, equipment, tools, and construction equipment and machinery, including reasonable overhead and profit on Work executed and direct costs incurred by reason of such termination. The total recovery of the Contractor shall not exceed the unpaid balance of the Contract Sum.
- C. Contractor may stop the Work for failure of Port to pay undisputed amounts. The Contractor may stop Work under the Contract if the Port does not pay undisputed amounts due and owing to the Contractor within fifteen (15) days of the date established in the Contract Documents. If the Port fails to pay undisputed amounts, the Contractor may, upon fifteen (15) additional days' written notice to the Port, during which the Port can cure, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately, and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up.

9.05 SUBCONTRACT ASSIGNMENT UPON TERMINATION

- A. Subcontracts assigned upon termination. Each subcontract is hereby assigned by the Contractor to the Port provided that:
 - 1. The Port requests that the subcontract be assigned;
 - 2. The assignment is effective only after termination by the Port and only for those subcontracts that the Port accepts in writing; and
 - a. The assignment is subject to the prior rights of the surety, if any, under any bond issued in accordance with the Contract Documents.

When the Port accepts the assignment of a subcontract, the Port assumes the Contractor's rights and obligations under the subcontract, but only for events and payment obligations that arise after the date of the assignment.

ARTICLE 10 - BONDS

10.01 CONTRACTOR PERFORMANCE AND PAYMENT BONDS

- A. Contractor to furnish performance and payment bonds. Within ten (10) days following its receipt of a notice of award, and as part of the Contract Sum, the Contractor shall secure and furnish duly executed performance and payment bonds using the forms furnished by the Port. The bonds shall be executed by a surety (or sureties) reasonably acceptable to the Port, admitted and licensed in the State of Washington, registered with the Washington State Insurance Commissioner, and possessing an A.M. Best rating of "A minus, FSC (6)" or better and be authorized by the U.S. Department of the Treasury. Pursuant to RCW 39.08, the bonds

shall be in an amount equal to the Contract Sum, and shall be conditioned only upon the faithful performance of the Contract by the Contractor within the Contract Time and upon the payment by the Contractor of all taxes, fees, and penalties to the State of Washington and all laborers, Subcontractors, and suppliers, and others who supply provisions, equipment, or supplies for the performance of the Work covered by this Contract. The bonds shall be signed by the person or persons legally authorized to bind the Contractor.

- B. Port may notify surety. If the Port makes or receives a claim against the Contractor, the Port may, but is not obligated to, notify the Contractor's surety of the nature and amount of the claim. If the claim relates to a possibility of a Contractor's default, the Port may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

ARTICLE 11 - DISPUTE RESOLUTION

11.01 NOTICE OF PROTEST AND CLAIM

- A. Dispute resolution procedure mandatory. All claims, direct or indirect, arising out of, or relating to, the Contract Documents or the breach thereof, shall be decided exclusively by the following alternative dispute resolution procedure unless the parties mutually agree otherwise. If the Port and Contractor agree to a partnering process to assist in the resolution of disputes, the partnering process shall occur prior to, and not be in place of, the mandatory dispute resolution procedures set forth below.
- B. Notice of protest defined. Except for claims requiring notice before proceeding with the affected Work as otherwise described in the Contract Documents, the Contractor shall provide immediate oral notice of protest to the Engineer prior to performing any disputed Work and shall submit a written notice of protest to the Port within seven (7) days of the occurrence of the event giving rise to the protest that includes a clear description of the event(s). The protest shall identify any point of disagreement, those portions of the Contract Documents believed to be applicable, and an estimate of quantities and costs involved. When a protest relates to cost, the Contractor shall keep full and complete records and shall permit the Port to have access to those records at any time as requested by the Port.
- C. Claim defined. A claim is a demand by one of the parties seeking adjustment or interpretation of the Contract terms, payment of money, extension of time or other relief with respect to the terms of the Contract Documents. The term "claim" also includes all disputes and matters in question between the Port and Contractor arising out of or relating to the Contract Documents. Claims must be initiated in writing and include a detailed factual statement and clear description of the claim providing all necessary dates, locations and items of Work, the date or dates on which the events occurred that give rise to the claim, the names of employees or representatives knowledgeable about the claim, the specific provisions of the Contract Documents that support the claim, any documents or oral communications that support the claim, any proposed change in the Contract Sum (showing all components and calculations) and/or Contract Time (showing cause and analysis of the resultant delay in the critical path), and all other data supporting the claim. Claims shall also be submitted with a statement certifying, under penalty of perjury, that the claim as submitted is made in good faith, that the supporting cost and pricing data are true and accurate to the best of Contractor's knowledge and belief, that the claim is fully supported, and that the amount requested accurately reflects the adjustment in the Contract Sum or Contract Time for which Contractor believes the Port is liable. A claim shall be deemed to include all changes, direct and indirect, in cost and in time to which the Contractor and Subcontractors of any tier are entitled and may not contain reservations of rights without the Port's written approval; any unapproved reservations of rights shall be without effect.

- D. Claim procedure. The Contractor shall submit a written claim within thirty (30) days of providing written notice of protest. The Contractor may delay submitting supporting data by an additional thirty (30) days if it notifies the Port in its claim that substantial data must be assembled. Any claim of a Subcontractor of any tier may be brought only through, and after review by and concurrence of, the Contractor.
- E. Failure to comply with notice of protest and claim requirements waives claims. Any notice of protest by the Contractor and any claim of the Contractor, whether under the Contract or otherwise, must be made pursuant to and in strict accordance with the applicable provisions of the Contract. Failure to properly and timely submit a notice of protest or to timely submit a claim shall waive the claim. No act, omission, or knowledge, actual or constructive, of the Port shall waive the requirement for timely written notice of protest and a timely written claim unless the Port and the Contractor sign an explicit, unequivocal written waiver approved by the Port. The Contractor expressly acknowledges and agrees that the Contractor's failure to timely submit required notices of protest and/or timely submit claims has a substantial impact upon and prejudices the Port. For the purpose of calculating time periods, an "event giving rise to a claim," among other things, is not a Request for Information but rather is a response that the Contractor believes would change the Contract Sum and/or Contract Time.
- F. False claims. The Contractor shall not make any fraudulent misrepresentations, concealments, errors, omissions, or inducements to the Port in the formation or performance of the Contract. If the Contractor or a Subcontractor of any tier submits a false or frivolous claim to the Port, which for purposes of this Section 11.01(F) is defined as a claim based in whole or in part on a materially incorrect fact, statement, representation, assertion, or record, the Port shall be entitled to collect from the Contractor by offset or otherwise (without prejudice to any right or remedy of the Port) any and all costs and expenses, including investigation and consultant costs, incurred by the Port in investigating, responding to, and defending against the false or frivolous claim.
- G. Compliance with lien and retainage statutes required. If a claim relates to or is the subject of a lien or retainage claim, the party asserting the claim may proceed in accordance with applicable law to comply with the notice and filing deadlines prior to resolution of the claim by mediation or by litigation.
- H. Performance required pending claim resolution. Pending final resolution of a claim, the Contractor shall continue to perform the Contract and maintain the Progress Schedule, and the Port shall continue to make payments of undisputed amounts due in accordance with the Contract Documents.

11.02 MEDIATION

- A. Claims must be subject to mediation. At any time following the Port's receipt of a written claim, the Port may require that an officer of the Contractor and the Port's designee (all with authority to settle) meet, confer, and attempt to resolve a claim. If the claim is not resolved during this meeting, the claim shall be subject to mandatory mediation as a condition precedent to the initiation of litigation. This requirement can be waived only by an explicit, written waiver signed by the Port and the Contractor.
- B. Mediation procedure. A request for mediation shall be filed in writing with the other party to the Contract, and the parties shall promptly attempt to agree upon a mediator. If the parties have not reached agreement within thirty (30) days of the request, either party may file the request with the American Arbitration Association or such other alternative dispute resolution service to which the parties mutually agree, with a copy to the other party, and the mediation shall be administered by the American Arbitration Association (or other agreed service). The parties to

the mediation shall share the mediator's fee and any filing fees equally. The mediation shall be held in Pierce County, Washington unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof. Unless the Port and the Contractor mutually agree in writing otherwise, all claims shall be considered at a mediation session that shall occur prior to Final Completion.

11.03 LITIGATION

- A. Claims not resolved by mediation are subject to litigation. Claims not resolved through mediation shall be resolved by litigation unless the parties mutually agree otherwise. The venue for any litigation shall be Pierce County, Washington. The Contractor may bring no litigation on claims unless such claims have been properly raised and considered in the procedures of this Article 11. The Contractor must demonstrate in any litigation that it complied with all requirements of this Article.
- B. Litigation must be commenced promptly. All unresolved claims of the Contractor shall be waived and released unless the Contractor has complied with the requirements of the Contract Documents, and litigation is served and filed within 180 days of the date of Substantial Completion approved in writing by the Port or termination of the Contract. The pendency of mediation (the time period between receipt by the non-requesting party of a written mediation request and the date of mediation) shall toll these deadlines until the earlier of the mediator providing written notice to the parties of impasse or thirty (30) days after the date of the mediation session.
- C. Port not responsible for attorneys' fees. Neither the Contractor nor a Subcontractor of any tier, whether claiming under a bond or lien statute or otherwise, shall be entitled to attorneys' fees directly or indirectly from the Port (but may recover attorneys' fees from the bond or statutory retainage fund itself to the extent allowable under law).
- D. Port may join Contractor in dispute. The Port may join the Contractor as a party to any litigation or arbitration involving the alleged fault, responsibility, or breach of contract of the Contractor or Subcontractor of any tier.

ARTICLE 12 - MISCELLANEOUS

12.01 GENERAL

- A. Rights and remedies are cumulative. The rights and remedies of the Port set forth in the Contract Documents are cumulative and in addition to and not in limitation of any rights and remedies otherwise available to the Port. The pursuit of any remedy by the Port shall not be construed to bar the Port from the pursuit of any other remedy in the event of similar, different, or subsequent breaches of this Contract. All such rights of the Port shall survive completion of the Project or termination of the Contractor.
- B. Reserved rights do not give rise to duty. The rights reserved or possessed by the Port to take any action shall not give rise to a duty for the Port to exercise any such right.

12.02 WAIVER

- A. Waiver must be in writing and authorized by Port. Waiver of any provisions of the Contract Documents must be in writing and authorized by the Port. No other waiver is valid on behalf of the Port.
- B. Inaction or delay not a waiver. No action, delay in acting, or failure to act by the Port shall constitute a waiver of any right or remedy of the Port, or constitute an approval or acquiescence of any breach or defect in the Work. Nor shall any delay or failure of the Port to

act waive or otherwise prejudice the right of the Port to enforce a right or remedy at any subsequent time.

- C. Claim negotiation not a waiver. The fact that the Port and the Contractor may consider, discuss, or negotiate a claim that has or may have been defective or untimely under the Contract shall not constitute a waiver of the provisions of the Contract Documents unless the Port and the Contractor sign an explicit, unequivocal waiver.

12.03 GOVERNING LAW

- A. Washington law governs. This Contract and the rights and duties of the parties hereunder shall be governed by the internal laws of the State of Washington, without regard to its conflict of law principles.

12.04 COMPLIANCE WITH LAW

- A. Contractor to comply with applicable laws. The Contractor shall at all times comply with all applicable Federal, State and local laws, ordinances, and regulations. This compliance shall include, but is not limited to, the payment of all applicable taxes, royalties, license fees, penalties, and duties.
- B. Contractor to provide required notices. The Contractor shall give notices required by all applicable Federal, State, and local laws, ordinances and regulations bearing on the Work.
- C. Contractor to confine operations at site to permitted areas. The Contractor shall confine operations at the Project site to areas permitted by applicable laws, ordinances, permits, rules and regulations, and lawful orders of public authorities and the Contract Documents.

12.05 ASSIGNMENT

- A. Assignment. The Port and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to the other party and to the partners, successors, assigns and legal representatives of such other party. The Contractor may not assign, transfer, or novate all or any portion of the Contract, including but not limited to any claim or right to the Contract Sum, without the Port's prior written consent. If the Contractor attempts to make an assignment, transfer, or novation without the Port's consent, the assignment shall be of no effect, and Contractor shall nevertheless remain legally responsible for all obligations under the Contract. The Contractor also shall not assign or transfer to any third party any claims it may have against the Port arising under the Contract or otherwise related to the Project.

12.06 TIME LIMIT ON CAUSES OF ACTION

- A. Time limit on causes of action. The Port and Contractor shall commence all causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the dispute resolution procedure set forth in Article 11 of these General Conditions, within the time period specified by applicable law, and within the time limits identified in the Contract Documents. The Contractor waives all claims and causes of action not commenced in accordance with this Section 12.06.

12.07 SERVICE OF NOTICE

- A. Notice. Written notice under the Contract Documents by either the Contractor or Port may be served on the other party by personal service, electronic or facsimile transmission, or delivery service to the last address provided in writing to the other party. For the purpose of measuring time, notice shall be deemed to be received by the other party on the next business day following the sender's electronic or facsimile transmittal or delivery by delivery service.

12.08 RECORDS

- A. Contractor and Subcontractors to maintain records and cooperate with Port audit. The Contractor and Subcontractors of any tier shall maintain books, ledgers, records, documents, estimates, bids, correspondence, logs, schedules, emails, and other tangible and electronic data and evidence relating or pertaining to costs and/or performance of the Contract ("records") to such extent and in such detail as will properly reflect and fully support compliance with the Contract Documents and with all costs, charges and other amounts of whatever nature. The Contractor shall preserve these records for a period of six (6) years following the date of Final Acceptance under the Contract. Within seven (7) days of the Port's request, both during the Project and for six (6) years following Final Acceptance, the Contractor and Subcontractors of any tier shall make available at their office during normal business hours all records for inspection, audit and reproduction (including electronic reproduction) by the Port or its representatives; failure to fully comply with this requirement shall constitute a material breach of contract and a waiver of all claims by the Contractor and Subcontractors of any tier.
- B. Rights under RCW 42.56. The Contractor agrees, on behalf of itself and Subcontractors of any tier, that any rights under Chapter 42.56 RCW will commence at Final Acceptance, and that the invocation of such rights at any time by the Contractor or a Subcontractor of any tier, or their respective representatives, shall initiate an equivalent right to disclosures from the Contractor and Subcontractors of any tier for the benefit of the Port.

12.09 STATUTES

- A. Contractor to comply with Washington statutes. The Contractor shall abide by the provisions of all applicable statutes, regulations, and other laws. Although a number of statutes are referenced in the Contract Documents, these references are not meant to be and are not a complete list.
 - 1. Pursuant to RCW 39.06, "Registration, Licensing of Contractors," the Contractor shall be registered and licensed as required by the laws of the State of Washington, including but not limited to RCW 18.27, "Registration of Contractors," and shall satisfy all State of Washington bonding and insurance requirements. The Contractor shall also have a current state unified business identifier number; have industrial insurance coverage for the Contractor's employees working in Washington as required by Title 51 RCW; have an employment security department number as required by Title 50 RCW; have a state excise tax registration number as required in Title 82 RCW, and; not be disqualified from bidding on any public works contract under RCW 39.06.010 (unregistered or unlicensed contractors) or RCW 39.12.065(3) (prevailing wage violations).
 - 2. The Contractor shall comply with all applicable provisions of RCW 49.28, "Hours of Labor."
 - 3. The Contractor shall comply with pertinent statutory provisions relating to public works of RCW 49.60, "Discrimination."
 - 4. The Contractor shall comply with pertinent statutory provisions relating to public works of RCW 70.92, "Provisions in Buildings for Aged and Handicapped Persons," and the Americans with Disabilities Act.
 - 5. Pursuant to RCW 50.24, "Contributions by Employers," in general and RCW 50.24.130 in particular, the Contractor shall pay contributions for wages for personal services performed under this Contract or arrange for an acceptable bond.
 - 6. The Contractor shall comply with pertinent provisions of RCW 49.17, "Washington Industrial Safety and Health Act," and Chapter 296-155 WAC, "Safety Standards for Construction Work."

7. Pursuant to RCW 49.70, "Worker and Community Right to Know Act," and WAC 296-62-054 et seq., the Contractor shall provide to the Port and have copies available at the Project site, a workplace survey or material safety data sheets for all "hazardous" chemicals under the control or use of Contractor or any Subcontractor of any tier.
8. All products and materials incorporated into the Project as part of the Work shall be certified as "asbestos-free" and "lead-free" by United States standards, and shall also be free of all hazardous materials or substances. At the completion of the Project, the Contractor shall submit certifications of asbestos-free and of lead-free materials certifying that all materials and products incorporated into the Work meet the requirements of this Section, and shall also certify that materials and products incorporated into the Work are free of hazardous materials and substances.

END OF SECTION

PART 1 - GENERAL

1.01 RELATED WORK DESCRIBED ELSEWHERE

- A. The provisions and intent of the Contract, including the General and Supplemental Conditions apply to this work as if specified in this section. Work related to this section is described throughout these Specifications.

1.02 SUBMITTAL REQUIREMENTS

- A. Evidence of the required insurance within 10 days of the issued Notice of Award to the Contractor.
- B. Updated evidence of insurance as required until final completion.

1.03 CONTRACTOR LIABILITY INSURANCE

- A. The Contractor shall secure and maintain until Final Completion, at its sole cost and expense, the following insurance in carriers reasonably acceptable to the Port, licensed in the State of Washington, registered with the Washington State Insurance Commissioner, and possessing an A.M. Best rating of "A-, FSC (6)" or better.
- B. The Port of Tacoma (Port) will be included as an additional insured(s) for both ongoing and completed operations by endorsement to the policy using ISO Form CG 20 10 11 85 or forms CG 20 10 03 97 and CG 20 37 10 01 (or equivalent coverage endorsements). The inclusion of the Port as an additional insured(s) shall not create premium liability for the Port.

Also, by endorsement to the policy, there shall be:

- 1. An express waiver of subrogation in favor of the Port;
 - 2. A cross liabilities clause,
 - 3. An endorsement stating that the Contractor's policy is primary and not contributory with any insurance carried by the Port.
- C. If the Contractor, Supplier or Subcontractor's will perform any work requiring the use of a licensed professional per RCW 18 the Contractor shall provide evidence to the Port of professional liability insurance in amounts not less than \$1,000,000.
 - D. This insurance shall cover all of the Contractors' operations of whatever nature connected in any way with the Contract, including any operations performed by the Contractor's Subcontractors of any tier. **It is the obligation of the Contractor to ensure that all Subcontractors (at whatever level) carry a similar program that provides the identified types of coverage, limits of liability, inclusion of the Port as additional insured(s), waiver of subrogation and cross liabilities clause.** The Port reserves the right to reject any insurance policy as to company, form, or substance. Contractor's failure to provide or the Port's acceptance of the Contractor's certificate of insurance does not waive the Contractor's obligation to comply with the insurance requirements of the Contract as specifically described below:
 - 1. Commercial General Liability Insurance on an Occurrence Form Basis including but not limited to:
 - a. Bodily Injury Liability;
 - b. Property Damage Liability;
 - c. Contractual Liability;

- d. Products - Completed Operations Liability;
 - e. Personal Injury Liability;
- Alternatively, a Commercial General Liability (CGL) policy is acceptable if all of the above coverages are incorporated in the policy and there are no marine exclusions that will remove coverage for either vessels or work done by or above or around the water.
- 2. Comprehensive Automobile Liability including but not limited to:
 - a. Bodily Injury Liability;
 - b. Property Damage Liability;
 - c. Personal Injury Liability;
 - d. Owned and Non-Owned Automobile Liability; and
 - e. Hired and Borrowed Automobile Liability.
 - 3. Contractor's Pollution Liability (CPL) covering claims for bodily injury, property damage and cleanup costs and environmental damages from pollution conditions arising from the performance of covered operations.
 - a. If the Work involves remediation or abatement of regulated waste to include but not limited to: asbestos containing materials, lead containing products, mercury, PCB, underground storage tanks or other hazardous materials or substances, the CPL policy shall not exclude such coverage or a specific policy covering such exposure shall be required from the Contractor and all Subcontractors performing such Work.
 - b. If the Work involves transporting regulated materials or substances or waste, a separate policy or endorsement to the CPL policy specifically providing coverage for liability and cleanup arising from an upset of collision during transportation of hazardous materials or substances shall be required from the Contractor and all Subcontractors performing such Work.
 - c. It is preferred that CPL insurance shall be on a true occurrence form without a sunset clause. However, if CPL insurance is provided on a Claims Made basis, the policy shall have a retroactive date prior to the start of this project and this insurance shall be kept in force for at least three years after the final completion of this project. Alternatively, the contractor at its option may provide evidence of extended reporting period of not less than three (3) years in its place. The Contractor shall be responsible for providing the Port with certificates of insurance each year evidencing this coverage.
 - d. The Port shall be named as an Additional Insured(s) on the CPL policy.
- E. Except where indicated above, the limits of all insurance required to be provided by the Contractor shall be not less than \$2,000,000 for each occurrence and \$2,000,000 in the aggregate. However, coverage in the amounts of these minimum limits shall not be construed as to relieve the Contractor from liability in excess of such limits. The Additional Insured endorsement shall NOT be limited to the amounts specified by this contract unless expressly waived in writing by the Port of Tacoma.
 - F. Contractor shall certify that its operations are covered by the Washington State Worker's Compensation Fund. The Contractor shall provide its Account Number or, if self-insured, its Certificate of Qualification Number. The Contractor shall also provide evidence of Stop-Gap Employers' Liability Insurance.

- G. The Contractor shall furnish within ten (10) days following issuance of the Notice of Award a certificate of insurance satisfactory to the Port evidencing that insurance in the types and minimum amounts required by the Contract Documents has been secured. The Certificate of Insurance shall be signed by an authorized representative of the insurer together with a copy of the endorsement, which shows that the Port is named as additional insured.
- H. Contractor shall provide at least forty-five (45) days prior written notice to the Port of any termination or material change or ten (10) days notice in the case of non-payment of premium(s).
- I. If the Contractor is required to make corrections to the Work after Final Completion, the Contractor shall obtain at its own expense, prior to the commencement of any corrective work, insurance coverage as required by the Contract Documents, which coverage shall be maintained until the corrections to the Work have been completed and accepted by the Port.

1.04 BUILDER'S RISK INSURANCE

- A. Until Final Completion of the Work, the construction Work is at the risk of the Contractor and no partial payment shall constitute acceptance of the Work or relieve the Contractor of responsibility of completing the Work under the Contract.
- B. Whenever the estimated cost of the Work is less than \$25,000,000, the Port will purchase and maintain, in a company or companies lawfully authorized and admitted to do business in Washington, property insurance written on a builder's risk "all-risk" including Earthquake and Flood with applicable sub-limits, or equivalent policy form to cover the course of construction in the amount of the full insurable value thereof. This property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made or until no person or entity other than the Port has an insurable interest in the property, whichever is later. This insurance shall include interests of the Port, the Contractor, and Subcontractors of any tier on the Project. There may be some differences between this Section and the builder's risk insurance secured by the Port; therefore, the Contractor shall provide an "installation floater" or similar property coverage for materials not yet installed, whether stored on site or off site or in transit, and the Contractor shall obtain property coverage for all Contractor-owned equipment and tools-each loss may be subject to a deductible. Losses up to the deductible amount shall be the responsibility of the Contractor. All tools and equipment not intended as part of the construction or installation will be the sole responsibility of the Contractor.

PART 2 - PRODUCTS - NOT USED

PART 3 - PRODUCTS - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 PREVAILING AND OTHER REQUIRED WAGES

- A. The Contractor shall pay (and shall ensure that all Subcontractors of any tier pay) all prevailing wages and other wages (such as Davis-Bacon Act wages) applicable to the Project.
- B. Pursuant to RCW 39.12, "Prevailing Wages on Public Works," no worker, laborer, or mechanic employed in the performance of any part of the Work shall be paid less than the "prevailing rate of wage" in effect as of the date that bids are due.
 - 1. Based on the bid submittal deadline for this project, the applicable effective date for prevailing wages for this project is June 13, 2018.
- C. The State of Washington prevailing wage rates applicable for this public works project, which is located in Pierce County, may be found at the following website address of the Department of Labor and Industries:

<https://fortress.wa.gov/lni/wagelookup/prvWagelookup.aspx>
- D. The schedule of the prevailing wage rates is made a part of the Contract Documents by reference as though fully set forth herein; and a copy of the applicable prevailing wage rates are also available for viewing at the Port Administration Building, located at One Sitcum Plaza, Tacoma, WA 98421 (253-383-5841). Upon request to the Procurement Department at procurement@portoftacoma.com, the Port will email or mail a hard copy of the applicable Journey Level prevailing wages for this project.
- E. Questions relating to prevailing wage data should be addressed to the Industrial Statistician.

Mailing Address: Washington State Department of Labor and Industries
Prevailing Wage Office
P.O. Box 44540
Olympia, WA 98504

Telephone: (360) 902-5335

Facsimile: (360) 902-5300

- 1. If there is any discrepancy between the attached or provided schedule of prevailing wage rates and the published rates applicable under WAC 296-127-011, or if no schedule is attached, the applicable published rates shall apply with no increase in the Contract Sum. It is the Contractor's responsibility to ensure that the correct prevailing wage rates are paid.
- F. Statement to Pay Prevailing Wages
 - 1. Prior to any payment being made by the Port under this Contract, the Contractor, and each Subcontractor of any tier, shall file a Statement of Intent to Pay Prevailing Wages under oath with the Port and certified by the Director of Labor and Industries.
 - 2. The statement shall include the hourly wage rate to be paid to each classification of workers entitled to prevailing wages, which shall not be less than the prevailing rate of wage, and the estimated number of workers in each classification employed on the Project by the Contractor or a Subcontractor of any tier, as well as the Contractor's contractor registration number and other information required by the Director of Labor and Industries.

3. The statement, and any supplemental statements, shall be filed in accordance with the requirements of the Department of Labor and Industries. No progress payment shall be made until the Port receives such certified statement.
- G. The Contractor shall post in a location readily visible to workers at the Project site (1) a copy of the Statement of Intent to Pay Prevailing Wages approved by the Industrial Statistician of the Department of Labor and Industries and (2) the address and telephone number of the Industrial Statistician of the Department of Labor and Industries to whom a complaint or inquiry concerning prevailing wages may be directed.
- H. If a State of Washington prevailing wage rate conflicts with another applicable wage rate (such as Davis-Bacon Act wage rate) for the same labor classification, the higher of the two shall govern.
- I. Pursuant to RCW 39.12.060, if any dispute arises concerning the appropriate prevailing wage rate for work of a similar nature, and the dispute cannot be adjusted by the parties in interest, including labor and management representatives, the matter shall be referred for arbitration to the Director of the Department of Labor and Industries, and his or her decision shall be final and conclusive and binding on all parties involved in the dispute.
- J. Immediately following the end of all work completed under this Contract, the Contractor, and each Subcontractor of any tier, shall file an approved Affidavit of Wages Paid with the L&I.
- K. The Contractor shall defend (at the Contractor's sole cost, with legal counsel approved by Port), indemnify and hold the Port harmless from all liabilities, obligations, claims, demands, damages, disbursements, lawsuits, losses, fines, penalties, costs and expenses, whether direct, indirect, including but not limited to attorneys' fees and consultants' fees and other costs and expenses, from any violation or alleged violation by the Contractor or any Subcontractor of any tier of RCW 39.12 ("Prevailing Wages on Public Works") or Chapter 51 RCW ("Industrial Insurance"), including but not limited to RCW 51.12.050.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 REQUIREMENTS APPLICABLE PORT-WIDE

- A. The Contractor shall submit prior to the start of work a list of emergency contact numbers for itself and subcontractors, suppliers and manufacturer representatives. Each person on the project site shall have a valid identification card that is tamper proof with laminated photo identification such as one of the following:
1. State-issued Driver's license (also required if driving a vehicle)
 2. Card issued by a governmental agency
 3. Passport
 4. Identification card issued by the Port of Tacoma
 5. Pacific Maritime Association card, or
 6. Labor organization identification card

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 SCOPE

- A. The accompanying Drawings and Specifications show and describe the location and type of Work to be performed under this project. Work is more specifically defined on the drawings listed in Section 00 01 15.
 - 1. The Work under this contract is to provide, furnish and install all labor, materials and equipment required to complete the work, installed, tested, and ready for use, and as described in these documents.
 - 2. Site preparation and site demolition, building demolition, excavation, backfill and grading, subbase, asphalt and concrete paving, fencing and gates, landscaping, pavement markings, stormwater system, bioretention swales, stormwater treatment vaults, new stormwater outfall, site utilities including water and sewer, site electrical and low voltage, and lighting .

1.02 1.02 LOCATION

- A. The work is located at:
 - 3400 Taylor Way
 - Tacoma, WA

1.03 WORK PERFORMED UNDER SEPARATE CONTRACTS

- A. The Contractor shall, by way of the Engineer, familiarize itself with other contracts which have been awarded, or that are about to be awarded or are in progress in the same or immediate area. The Contractor shall coordinate the progress of its work with the established schedules for completion and phasing.
 - 1. Building Contractor
 - a. Transdevelopment
 - b. Construction of buildings on site including processing building, car wash and body shop, fueling island and guard houses.
 - 2. Railroad Construction Contractor
 - a. Port of Tacoma
 - b. On-site track and turnout construction.
 - 3. Tacoma Rail off-site rail and right of way improvements
 - a. Tacoma Rail
 - b. Performing work in the Taylor Way and Alexander right of way to connect to new track on site.
 - 4. PSE
 - a. Port of Tacoma
 - b. Installing gas service to site buildings.
 - 5. TPU utilities
 - a. Port of Tacoma

- b. Removing existing power facilities and Installing permanent power.

1.04 PORT PROVIDED MATERIALS

- A. Port of Tacoma will furnish the Contractor with the following material:

- 1. Concrete stormwater treatment vaults.
- 2. Site lighting and poles.

- B. Reference Section 01 64 00 - Owner Provided Materials for coordination.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. This Section specifies work sequence and constraints.
- B. The purpose of the milestones, sequence and limitations of construction are to ensure that the Contractor understands the requirements and limitations on its work by the specific characteristics of the Contract, schedules and conducts work in a manner consistent with achieving these purposes, and complies with the construction schedule, the specific sequence, constraints, milestones and limitations of work specified.
- C. Sequence of construction: Plan the sequence of construction to accommodate all the requirements of the specifications. The Contract Price shall include all specified requirements as described in this Section.

1.02 CONTRACTOR ACCESS AND USE OF PREMISES

- A. Activity Regulations
 - 1. Ensure Contractor personnel deployed to the project become familiar with and follow all regulations or restrictions established by the Engineer.
- B. Occupied Building
 - 1. The Contractor will demolish all existing buildings on the site upon receiving permission from the Engineer.
 - 2. Protect materials and equipment adjacent and/or related to Occupied Buildings prior to commencement of demolition until they are removed by Owner or the Engineer confirms items are surplus and may be removed by the Contractor.
- C. Work Site Regulations
 - 1. Keep within the limits of work and assigned avenues of ingress and egress. Do not enter any areas outside the designated work location unless previously approved by the Engineer. The Contractor must comply with the following conditions:
 - a. Be responsible for control and security of Contractor-owned equipment and materials at the work site. Report to Port Security (phone (253) 383-9472) any missing/lost/stolen property.
 - b. Ensure all materials, tools and equipment will be removed from the site or secured within the designated laydown areas at the end of each shift.

1.03 WORK SEQUENCE AND CONSTRAINTS - GENERAL

- A. Existing monitoring wells
 - 1. A network of existing, abandoned wells shall be removed as indicated in the Plans and Specifications.
 - 2. Certain monitoring wells shall be protected throughout construction activities and restored as indicated in the Plans and Specifications.
- B. Electrical Work Constraints
 - 1. Electrical transmission lines are located along the perimeter of the site at numerous locations. All work by the Contractor shall conform with the regulations of the serving electrical utilities.

2. Areas with low overhead clearances shall be identified and marked by the Contractor.
- C. The Contractor shall sequence and prioritize the Work in accordance with the following constraints and requirements.
1. Submit pre-work submittals per Section 01 30 00 within 5 days of Contract Execution required for Notice to Proceed and approval to access the site.
 2. Mobilize on site upon approval of pre-work submittals.
 3. Implement SWPPP requirements to begin work on site.
 4. Establish final grades for building pad of the processing building identified for the separate building subcontractor. Contractor shall coordinate through the Engineer to establish final grades for small additional buildings in other areas of the site for separate building contractor as required. The Contractor shall sequence all additional work in the building areas, such as utilities and paving, with the building contractor.
 5. Grade and construct bioretention swale and strip south of the future rail yard. Plug bioretention subdrain pipe until outfall is complete and connected.
 6. Establish final lines and grades, underdrain installation and sub-ballast installation for the work are identified for the separate rail installation contractor by no later than August 15, 2018. The Contractor shall coordinate paving of track crossings after the trackwork is complete. Contractor shall preserve access between the rail contractor's laydown area and the rail area.
 7. Contractor will demolish all existing buildings on the site upon receiving permission from the Engineer.
 8. Contractor shall prepare and execute a plan that coordinates stormwater retention and removal with construction of the new outfall and the initiation of pavement installation. The plan should include, at a minimum, operations during separate periods: first when an outfall is not yet available to the southwest and later, when an outfall is available and put into service.
 - a. Priority paving and completion of the stormwater treatment will be the north portion of the site that outfalls to the existing stormwater pond.
 - b. Notice to proceed on the Work on the stormwater outfall is dependent on pending permits.
 - c. In water work window is from July 15 to February 15. Construction of the stormwater pipe in Alexander and outfall shall not begin until permits are received.
 9. The Contractor shall prepare and execute a plan that completes pavement areas so as to establish the phased areas indicated in the Plans by the required interim completion date, recognizing weather conditions reasonably to be anticipated at the project location.
 10. Coordinate paving with gas utility installation anticipated in September - October.
 11. Coordinate with rail contractor anticipated to be on-site from August - December.
 12. Coordinate work with Tacoma Power. Permanent power infrastructure included in the Contract shall be complete prior to Tacoma Power installing cabling and meter. Tacoma Power can begin work in September.

1.04 INTERMIN MILESTONE

- A. The Contractor shall be complete with all Work shown in Phase 1 as shown on Contract Plan Sheet G1.3, including all Work within Phase 1 per the Contract plans, new outfall and connecting pipe, perimeter fencing around entire facility, primary power to all buildings and lighting within Phase 1 area, stabilization of entire site, building demolition, bioretention swales and strips, site utilities including water and sewer.
- B. The Engineer reserves the right to suspend sub-base placement or paving work if the subgrade is not suitable or weather conditions do not meet the specification.

1.05 SPECIAL EVENTS AND NOTICES

- A. Saturday, July 28, 2018 - August 4, 2018, the Puyallup Tribe of Indians is hosting the Paddle to Puyallup event. This event anticipates 10,000 to 15,000 guests along Taylor way staging to the old Ole and Charlie Site at 4224 Marine View Drive. The Emerald Queen paddlewheel site at 2102 Alexander Ave will be used for parking and shuttle service. Contractor shall work with the Puyallup Tribe transportation team to lessen project impacts on traffic.
- B. Two warehouses opening in September 2018 will increase traffic on Taylor Way.

PART 2 - PRODUCTS

PART 3 - EXECUTION

END OF SECTION

PART 1 - GENERAL

1.01 RELATED WORK DESCRIBED ELSEWHERE

- A. The provisions and intent of the Contract, including the General and Supplemental Conditions apply to this work as if specified in this section. Work related to this section is described throughout these Specifications.
- B. Individual submittals are required in accordance with the pertinent sections of these Specifications

1.02 PAYMENT PROCEDURES

- A. Monthly pay estimates shall clearly identify the work performed for the given time period based on the approved Schedule of Values.
 - 1. At the Pre-construction meeting, the Engineer and the Contractor shall agree upon a date each month when payment applications shall be submitted.
- B. Prior to submitting a payment application, the Contractor and Engineer shall meet each month to review the work accomplished to determine the actual quantities including labor, materials and equipment charges to be billed.
 - 1. Prior to the payment application meeting, the Contractor shall submit to the Engineer all measurement documentation as referenced in these contract documents; to include all measurement by weight, volume or field.
 - 2. For all change work being done on a force account basis, the Contractor shall submit prior to meeting with Engineer all Force Account back-up documentation as required to process the payment application where Force Account work is being billed. The Engineer and the Contractor shall review the documentation at the payment application meeting to verify quantities and review the work accomplished.
 - 3. The Contractor shall bring a copy of all documentation to the pay application meeting with the Engineer.
- C. Following the Engineers' review, the Contractor shall prepare an original pay estimate with complete supporting documentation attached and submit it electronically using Adobe PDF file format to cpinvoices@portoftacoma.com
- D. An estimated cashflow statement projecting the Contractor's monthly billings on the project shall be submitted with each payment application.
- E. An updated project schedule shall be submitted with each pay application.

1.03 PAYMENT PRICING

- A. Pricing for the various lump sum or unit prices in the Bid Form, as further specified herein, shall include all compensation to be received by the Contractor for furnishing all tools, equipment, supplies, and manufactured articles, and for all labor, operations, and incidentals appurtenant to the items of work being described, as necessary to complete the various items of the work in accordance with the requirements of the Contract Documents.
- B. Pricing also includes all costs of compliance with the regulations of public agencies having jurisdiction, including safety and health requirements of the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA).

- C. No separate payment will be made for any item that is not specifically set forth in the Bid Form, and all costs therefore shall be included in the prices named in the Bid Form for the various appurtenant items of work.
- D. All other work not specifically mentioned in the measurement and payment sections identified below shall be considered incidental to the work performed and merged into the various unit and lump sum prices bid. Payment for work under one item will not be paid for under any other item.
- E. The Port of Tacoma reserves the right to make changes should unforeseen conditions necessitate such changes. Where work is on a unit price basis, the actual quantities occasioned by such changes shall govern the compensation.

1.04 LUMP-SUM MEASUREMENT

- A. Lump-sum measurement will be for the entire item, unit of Work, structure, or combination thereof, as specified and as indicated in the Contractor's submitted bid.
 - 1. If the Contractor requests progress payments for lump-sum items, such progress payments will be made in accordance with an approved schedule of values. The quantity for payment for completed work shall be an estimated percentage of the lump sum amount, agreed to between the Engineer and Contractor, payable in monthly progress payments in increments proportional to the work performed in amounts as agreed between the Engineer and the Contractor.

1.05 REJECTED, EXCESS, OR WASTED MATERIALS

- A. Quantities of material wasted or disposed of in a manner not called for under the Contract; rejected loads of material, including material rejected after it has been placed by reasons of the failure of the Contractor to conform to the provisions of the Contract; material not unloaded from the transporting vehicle; material placed outside the lines indicated on the Contract Drawings or established by the Engineer; or material remaining on hand after completion of the Work, will not be paid for, and such quantities shall not be included in the final total quantities. No additional compensation will be permitted for loading, hauling, and disposing of rejected material.

1.06 MEASUREMENT AND PAYMENT

- A. Item # 1: Mobilization and Demobilization
 - 1. Payment for MOBILIZATION AND DEMOBILIZATION shall be for preparatory work and operations performed by the Contractor including, but not limited to completion and submittal and approval of the following:
 - a. Health Safety and Emergency Site Plan (HASP)
 - b. Schedule of Values
 - c. Detailed CPM progress schedule
 - d. Erosion and Sediment Control Plan
 - e. Soil Management Plan
 - f. Establishing Contractor's Project Manager, Superintendent, and other required specified personnel on the Work site full time.

- g. Furnishing and installing all temporary facilities and controls as needed for the safe and proper completion of the work, including utilities, sanitary facilities, barriers and enclosures, fences, staging and entrance areas, and field offices, as specified.
 - h. Mobilization onto the site required in support of the Contractor's first 30 days of operations.
 - i. Furnishing and installing project signs, as specified.
 - 2. Mobilization and Demobilization shall be paid at the lump sum price listed in the Contractor's submitted bid. Incremental payment shall be made for each location as follows:
 - a. 40% after completion of 5% of the total contract amount of other bid items have been earned.
 - b. 40% after completion of 20% of the total contract amount of other bid items have been earned.
 - c. 20% after completion of all work on the project has been completed, including cleanup and acceptance of the project by the Port.
- B. Item # 2: Site preparation and site demolition
 - 1. Item Description: This item includes all Work to prepare the site for construction including utility locates, TESC, protection or abandonment of existing monitoring wells, and miscellaneous demolition and all other temporary construction measures required for the project and included in the Contract Documents.
 - 2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
 - 3. Payment: This item will be paid for at the Contract lump sum price as specified in the Contractor's submitted bid, in accordance with the approved Schedule of Values.
- C. Item # 3: Building demolition
 - 1. Item Description: This item includes all Work to demolish and remove two buildings on site, including complying with the Hazardous Waste Survey included in the Contract Documents.
 - 2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
 - 3. Payment: This item will be paid for at the Contract lump sum price as specified in the Contractor's submitted bid, in accordance with the approved Schedule of Values.
- D. Item # 4: Excavation and grading
 - 1. Item Description: This item includes all Work to grade the site including site stripping, disposal of stripping, excavation and placement on-site fill, fine grading and related work required to prepare finish grades on the site per the Contract Documents
 - 2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
 - 3. Payment: This item will be paid for at the Contract lump sum price as specified in the Contractor's submitted bid, in accordance with the approved Schedule of Values..
- E. Item # 5: Hot mix asphalt paving and crushed surfacing

1. Item Description: This item includes all Work to furnish and install crushed surfacing and hot mix asphalt paving on the site per the Contract Documents.
 2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
 3. Payment: This item will be paid for at the Contract lump sum price as specified in the Contractor's submitted bid, in accordance with the approved Schedule of Values.
- F. Item # 6: Concrete pavement
1. Item Description: The item includes all Work to furnish and install concrete paving per the Contract Documents.
 2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
 3. Payment: This item will be paid for at the Contract lump sum price as specified in the Contractor's submitted bid, in accordance with the approved Schedule of Values.
- G. Item # 7: Fencing and gates
1. Item Description: This item includes all Work to furnish and install permanent fence, gates, gate motor, actuator and support, bollards and guardrail and related work necessary for a complete installation per the Contract Documents.
 2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
 3. Payment: This item will be paid for at the Contract lump sum price as specified in the Contractor's submitted bid, in accordance with the approved Schedule of Values.
- H. Item # 8: Landscaping
1. Item Description: This item includes all Work to furnish and install landscaping and related work necessary for a complete installation per the Contract Documents.
 2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
 3. Payment: This item will be paid for at the Contract lump sum price as specified in the Contractor's submitted bid, in accordance with the approved Schedule of Values.
- I. Item # 9: Pavement markings
1. Item Description: This item includes all Work to furnish and install pavement markings, striping and letters and numbers per the Contract Documents.
 2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
 3. Payment: This item will be paid for at the Contract lump sum price as specified in the Contractor's submitted bid, in accordance with the approved Schedule of Values.
- J. Item # 10: Stormwater system
1. Item Description: This item includes all Work to furnish and install pavement the stormwater system including all excavation, pipe bedding, backfill, catch basins, storm drain lines, track underdrain, cleanouts, in-line check valves, stormwater treatment vaults and related Work not included in other bid items per the Contract Documents.

2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
 3. Payment: This item will be paid for at the Contract lump sum price as specified in the Contractor's submitted bid, in accordance with the approved Schedule of Values.
- K. Item # 11: Stormwater Bioretention Swales
1. Item Description: This item includes all Work to furnish and install stormwater bioretention swales including all excavation, pipe bedding, backfill, cleanouts, in-line check valves and bioretention swales and bioretention collection manifold, bioretention swale underdrain and related Work not included in other bid items per the Contract Documents.
 2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
 3. Payment: This item will be paid for at the Contract lump sum price as specified in the Contractor's submitted bid, in accordance with the approved Schedule of Values.
- L. Item # 12: Stormwater Treatment Vaults Components
1. Item Description: This item includes all Work to furnish and install stormwater treatment vault components including inserts and media and other required components for a complete installation and utility oil water separators per the Contract Documents. The Contractor shall receive, protect and install Port provided precast concrete vaults per Section 01 64 00.
 2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
 3. Payment: This item will be paid for at the Contract lump sum price as specified in the Contractor's submitted bid, in accordance with the approved Schedule of Values.
- M. Item # 13: Site Utilities
1. Item Description: This item includes all Work to furnish and install all water, sanitary sewer utilities, and lift station included in the Contract Documents. .
 2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
 3. Payment: This item will be paid for at the Contract lump sum price as specified in the Contractor's submitted bid, in accordance with the approved Schedule of Values.
- N. Item # 14: Site Electrical, Lighting and Data Distribution Systems
1. Item Description: This item includes all Work to furnish and install all 13.8 KV power distribution, electrical low voltage power distribution, grounding, lighting, electrical data distribution systems complete included in the Contract Documents. The Contractor shall receive, protect and install Port provided lighting materials per Section 01 64 00.
 2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
 3. Payment: This item will be paid for at the Contract lump sum price as specified in the Contractor's submitted bid, in accordance with the approved Schedule of Values.
- O. Item # 15: New Outfall and Stormwater Manhole and Piping in Alexander Right of Way.

1. Item Description: This item includes all Work to complete construction of the stormwater crossing of Alexander Avenue and the Blair waterway outfall including but not limited to, traffic control and through access on Alexander Ave, excavation, backfill, pipe, manhole and shoreline outfall protection installation complete.
 2. Measurement: This item will be measured based on a percentage complete for the overall lump sum amount.
 3. Payment: This item will be paid for at the Contract lump sum price as specified in the Contractor's submitted bid, in accordance with the approved Schedule of Values.
- P. Item # 16: Removal and Disposal of Buried Structures Allowance
1. Item Description: This item includes all Work to removal and disposal of any unforeseen buried obstructions encountered per the Construction Documents
 2. Measurement: This item will be measured based on a time and material basis as documented with the Port inspector and approved by the Engineer in accordance with Section 00 72 00.
 3. Payment: This item will be paid for based on actual quantities for the period being billed. The allowance may be increased if additional work is required or a credit returned to the Port for any unused allowance.
- Q. Item # 17: Removal and Disposal of Contaminated Material Allowance
1. Item Description: The Work of this item includes removal and disposal of any contaminated material encountered in the former log yard or wet scrubber sludge area, or other unforeseen contamination anticipated to been encountered 5+ feet below grade during the Work per the Construction Documents and as authorized by the Engineer. It is anticipated that this material, after testing by the Port per Section 01 35 43.19, will be disposed of at a Subtitle D Landfill.
 2. Measurement: This item will be measured based on unit price per ton of material disposed.
 3. Payment: This item will be paid for based on actual quantities for the period being billed. The allowance may be increased if additional work is required or a credit returned to the Port for any unused allowance.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXEUCION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions, Supplementary Conditions and Division 0 and 1 Specifications sections shall apply to all sections of the Contract Documents including specifications, drawings, addenda or other changes of documents issued for bidding/construction.

General provisions of the Contract, including General Conditions, Supplementary Conditions and Division 0 and 1 Specifications sections shall apply to all sections of the Contract Documents including specifications, drawings, addenda or other changes of documents issued for bidding/construction.

1.02 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.

1.03 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment and methods of construction from those required by the Contract Documents and proposed by Contractor.
- B. The contract documents include performance specifications for products and equipment which meet project requirements. In those cases where a representative item or manufacturer is named in the specification it is provided for the sole purpose of identifying a product meeting the required functional performance. Where the words "or equal" are used a substitution request as further described is not required.
- C. Where non-competitive or sole source products or manufacturers are explicitly specified with the words "or approved equal", or "Engineer approved equal", or "as approved by the Engineer" are used, they shall be taken to mean "or approved equal". In these cases a substitution request as further described in this section, is required.

1.04 SUBMITTALS

- A. Post-Award Substitution Requests: Submit a substitution request as defined in 01 33 00 – Submittal Procedures. All substitution requests must be submitted by the Contractor and not a subcontractor or supplier.
 - 1. Substitution Request Form: Use a copy of form located in Section 00 63 25.
 - 2. Documentation: Show compliance with requirements for substitutions with the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or modifications needed to other parts of the Work that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable specification section. Significant qualities may include, but are not limited to, attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

- d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names, and addresses. Also provide names and addresses of the AE and Owners.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for project
 - j. Comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within 7 calendar days of receipt of a request for substitution. Engineer will notify Contractor through Port of acceptance or rejection of proposed substitution within 15 calendar days of receipt of request, or 7 calendar days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order or Minor Change in Work.
 - b. Use product originally specified if Engineer does not issue a decision on use of a proposed substitution within time allocated.
- B. Substitutions will not be considered when:
- 1. Indicated or implied on shop drawings or product data submittals without formal request submitted in accordance with this Section.
 - 2. Submittal for substitution request has not been reviewed and approved by Contractor.
 - 3. Acceptance will require substantial revision of Contract Documents or other items of the Work.
 - 4. Submittal for substitution request does not include point-by-point comparison of proposed substitution with specified product.

1.05 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage qualified testing agency to perform compatibility tests recommended by manufacturers.

PART 2 - PRODUCTS

2.01 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not later than 30 days prior to date required for preparation and review of related submittals.
1. Conditions: Engineer will consider Contractor's request for substitution when the following conditions are satisfied:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Requested substitution will not adversely affect Contractor's construction schedule.
 - c. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - d. Requested substitution is compatible with other portions of the Work
 - e. Requested substitution has been coordinated with other portions of the Work
 - f. Requested substitution provides specified warranty.
 - g. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Engineer will consider Contractor's requests for substitution if received within 10 days after the Notice of Award.
1. Conditions: Engineer will consider Contractor's request for substitution when the following conditions are satisfied:
 - a. Requested substitution offers Port a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Port must assume. Port's additional responsibilities may include compensation to Engineer for redesign and evaluation services, increased cost of other construction by Port, and similar considerations.
 - b. Requested substitution does not require extensive revisions to the Contract Documents.
 - c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - d. Requested substitution will not adversely affect Contractor's construction schedule.
 - e. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - f. Requested substitution is compatible with other portions of the Work.
 - g. Requested substitution has been coordinated with other portions of the Work.
 - h. Requested substitution provides specified warranty.
 - i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 - EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

1.03 SUBMITTALS

- A. The Contractor shall submit the following documentation to the Port:
 - 1. List of Labor Rates
 - a. For the Contractor and each subcontractor, a list of labor rates for each trade applicable to the scope of work to be performed. These submitted rates shall be broken down to include the base wage, fringes, FICA, SUTA, FUTA, industrial insurance and medical aid premiums as stated in the General Conditions. The rates shall not contain any travel time, safety, loss efficiency factors, overhead or profit. Rates shall be submitted for straight time, overtime and double time in a form acceptable to the Engineer. Contractor shall provide proof of all labor rate costs as required by the Engineer including the submission of a copy of the most current Workers Compensation Rate Notice from Labor & Industries and a copy of the Unemployment Insurance Tax Rate notice from the Employment security department.
 - 1) If labor rates change during the course of the project or additional labor rates become required to complete the work, the Contractor shall submit new rates for approval.
 - 2. List of Equipment.
 - a. Submit for the Contractor and each subcontractor, a list of equipment and rates applicable to the scope of work to be performed. The equipment rates shall conform to the rates shown on Equipment Watch. A separate page from equipment watch detailing the hourly rate shall be submitted as backup documentation for each piece of equipment.
 - 1) If the list of equipment and/or equipment rates changes during the course of the project or additional equipment becomes required to complete the work, the Contractor shall submit a new list and rates for approval.
 - 3. No applications for payment or change orders will be processed for the Contractor until labor and equipment rates have been submitted and approved.

1.04 METHOD TO CALCULATE ADJUSTMENTS TO CONTRACT PRICE

- A. One of the following methods shall be used:
 - 1. Unit Price Method;
 - 2. Firm Fixed Price Method (Lump Sum); or,
 - 3. Time and Materials Method (Force Account).
- B. The Port preferred methods are firm fixed price or unit prices.

1.05 MINOR CHANGES IN THE WORK

- A. Engineer will issue a written directive authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

1.06 PROPOSAL REQUESTS

- A. Port-Initiated Proposal Requests: The Engineer will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Work Change Proposal Requests issued by Engineer are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Contractor shall submit a written proposal within the time specified in the General Conditions. The proposal shall represent the Contractor's offer to perform the requested work, and the pricing set forth within the proposal shall represent full, complete, and final compensation for the proposed change and any impacts to any other Contract Work, including any adjustments in the Contract Time.
 - a. Include a breakdown of the changed work in sufficient detail that permits the Engineer to substantiate the costs.
 - 1) Generally, the cost breakdown should be divided into the time and materials categories listed in the General Conditions under Article 8.02B for either Lump Sum Proposals or Force Account Proposals.
 - 2) For Unit Price Proposals, include the quantity and description of all work involved in the unit pricing being proposed, along with a not to exceed total cost.
 - b. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- B. Contractor-Initiated Proposals: If latent or differing site conditions require modifications to the Contract, the Contractor may initiate a claim by submitting a request for a change to the Engineer.
 - 1. Notify the Engineer immediately upon finding differing conditions prior to disturbing the site.
 - 2. Provide follow-up written notification and differing site conditions proposal within the time frames set forth in the General Conditions.
 - 3. Provide the differing site condition change proposal in the same or similar manner as described above under 1.04.A.
 - 4. Comply with requirements in Section 01 25 00 Substitution Procedures During Construction if the proposed change requires substitution of one product or system for product or system specified.
 - 5. Proposal Request Form: Use form acceptable to Engineer.

1.07 PROCEEDING WITH CHANGED WORK

- A. The Engineer may issue a directive instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order per the General Conditions, Article 8.01.E.

1. The directive will contain a description of change in the Work and a not-to exceed amount. It will designate the method to be followed to determine the change in the Contract Sum or the Contract Time.

1.08 CHANGE ORDER PROCEDURES

A. Issuance of Change Order

1. On approval of the Contractor's proposal, and following successful negotiations, the Engineer will issue a Change Order for signature by the Contractor and execution by the Engineer.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

- A. This section includes specifications for preparation, format, and submittal of Schedule of Values.
- B. The Schedule of Values will establish unit prices for individual items of work.
- C. The Schedule of Values will be the basis for payment of contract work.

1.02 PREPARATION

- A. To facilitate monthly pay requests, develop the Schedule of Values based on the Contractor's submitted Bid. The schedule of Values shall be used to provide an allocation of the Work for measurement and payment to a level of detail to ensure accurate payment for the Work accomplished.
- B. Obtain the agreement of the Engineer on the Schedule of Values. No payment will be made prior to an agreed upon Schedule of Values.
- C. Include an updated version of the Schedule of Values as changes occur. Update the Schedule of Values to include:
 - 1. Dollars earned and percent complete for the current progress payment period.
 - 2. Dollars earned and percent complete to-date, excluding the current progress payment period.
 - 3. Total dollars earned and percent complete to-date.
 - 4. Total dollars remaining
 - 5. Changes resulting from Change Orders
- D. The total value of the line items in the Schedule of Values plus any approved Change Orders shall be equal to the current approved contract price.
- E. The value of stored material shall be identified in the Schedule of Values with both a material-purchase activity and a separate corresponding installation activity in the Construction Schedule(s).
- F. Include as exhibits, drawings or sketches as necessary, to better define the limits of pay items that are in close proximity and that have no clear boundary in the Contract Drawings.

1.03 SUBMITTAL

- A. Submit preliminary Schedule of Values within 10 days of the effective date of the Notice to Proceed.
- B. Submit corrected Schedule of Values within 10 days upon receipt of reviewed Schedule of Values.
- C. At the Engineer's request, submit documentation substantiating the cost allocations for line items within the Schedule of Values.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 SCHEDULE OF VALUES

- A. Submit the Schedule of Values in a form acceptable to the Engineer.

- B. Provide updated Schedule of Values as required by the Engineer and as indicated in the Contract Documents.

END OF SECTION

PART 1 - GENERAL

1.01 SCOPE

- A. The purpose of this section is to provide the framework for communication between the Port and the Contractor by defining the types and timing of administrative tasks including meetings and other items related to communications.

1.02 NOTICE TO PROCEED

- A. Contract execution will be made per the requirements of the Contract Documents. Once the contract has been executed and all pre-work submittals have been received, the Engineer will issue a Notice to Proceed (NTP).
 - 1. In certain instances, the Engineer may issue to the Contractor a Limited NTP for specified elements of the work described in these Contract Documents.
- B. **The Contractor shall submit all pre-work submittals within 5 days of Contract Execution.**
 - 1. **Pre-work submittals shall be approved prior to the Engineering issuance of Notice to Proceed and prior to the Contractor mobilizing on-site. A list of all pre-work submittals required for Notice To Proceed include:**
 - a. **Section 00 73 63 Security Requirements**
 - b. **Section 01 35 29 Health and Safety plan and Spill Prevention plan**
 - c. **Section 01 57 13 TESC and Project SWPPP**
 - 2. **Prior to any earthwork and excavation of the site the Contractor shall have an approved soil management plan per section 01 35 43.19 consistent with the Material Management Plan in Appendix C. Note the Materials Management Plan includes Ecology's review and approval.**
 - 3. All other pre-work submittals list in Section 00 20 00 Price and Payment under mobilization shall be submitted within 21 days of Contract Execution.
 - 4. No contract time extension shall be granted for any delays in issuance of the NTP by the Engineer due to the Contractor's failure to provide acceptable submittals required by the Contract Documents.

1.03 COORDINATION

- A. The Contractor shall coordinate all its activities through the Engineer.
- B. The Contractor shall coordinate construction operations as required to execute the Work efficiently, to obtain the best results where installation of one part of the Work depends on other portions.

1.04 PROJECT MEETINGS

- A. Pre-Construction Meeting
 - 1. **After execution of the contract but prior to commencement of any work at the site, a mandatory one time meeting** will be scheduled by the Engineer to discuss and develop a mutual understanding relative to the administration of the safety program, preparation of the schedule of values, change orders, RFI's, submittals, scheduling prosecution of the work. Major subcontractors who will engage in the work shall attend.

2. Suggested Agenda: The agenda will include items of significance to the project. A sample agenda is attached to this section.
 3. Location of the Pre-Construction Meeting will be held at the Port of Tacoma Administration Building located at One Sitcum Plaza.
- B. Weekly Progress Meetings – Progress meetings include the Contractor, Engineer, consultants and others affected by decisions made.
1. The Engineer will arrange meetings, prepare standard agenda with copies for participants, preside at meetings, record minutes and distribute copies within ten working days to the Contractor, meeting participants, and others affected by decisions made.
 - a. The Engineer will approve submitted meeting minutes in writing within 10 working days.
 2. Attendance is required for the Contractor's job superintendent, major subcontractors and suppliers, Engineer, and representatives of the Port as appropriate to the agenda topics for each meeting.
 3. Standard Agenda
 - a. Review minutes of previous meeting.
 - b. Review of work progress.
 - c. Field observations, problems, and decisions.
 - d. Identification of problems that impede planned progress.
 - e. Maintenance of Progress Schedule (3 weeks ahead; 1 week back).
 - f. Corrective measures to regain projected schedules.
 - g. Planned progress during succeeding work period.
 - h. Coordination of projected progress.
 - i. Maintenance of quality and work standards.
 - j. Effect of proposed changes on progress schedule and coordination.
 - k. Demonstration that the project record drawings are up-to-date.
 - l. Other business relating to the work.
- C. Cost Meeting
1. A separate cost meeting may be set up by the Engineer to discuss RFI's (or any other issues) that may cause scope, schedule or monetary changes to the contracts in more detail than necessary at the progress meeting. The Engineer will arrange, host and provide an agenda for cost meetings. Attendees would include the Engineer, Contractor's job superintendent and others as invited.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The Port and Contractor shall use the Port Contract Management application (eBuilder®) for electronic information exchange throughout the duration of the Contract as later described.
 - 1. eBuilder is a web-based application accessed via the web.
 - 2. The Contractor will receive up to two separate user accounts for access to eBuilder®.
 - 3. The joint use of this system is to facilitate and coordinate the electronic exchange of Requests for Information, Submittals, Change Order Proposals, Pay Estimates and project specific correspondence.

1.02 USER ACCESS LIMITATIONS

- A. Contractor's access to eBuilder® is granted and controlled by the Engineer.
 - 1. The users assigned by the Contractor to use eBuilder shall be competent and experienced with the practices commonly employed in the industry for electronically submitting requests for information, submittals, product data, shop drawings and related items as required by the contract and the methods commonly used for project correspondence transmission and filing.
 - 2. Any users assigned by the Contractor whom the Engineer determines is incapable of performing the prescribed tasks in an accurate, competent and efficient manner will be removed upon request from the Engineer. The qualifications and identity of a replacement user shall be submitted within 24 hours for consideration by the Engineer. Once accepted by the Engineer, the user account will be modified accordingly.

1.03 CONTRACTOR TECHNOLOGY REQUIREMENTS

- A. The Contractor is responsible for providing and maintaining web enabled devices capable of running the desktop version of the e-Builder website effectively.

1.04 CONTRACTOR SOFTWARE REQUIREMENTS

- A. The Contractor is responsible for providing and maintaining the following:
 - 1. An office suite that is Microsoft Office 2013 compatible for generation and manipulation of correspondence.
 - 2. A program capable of editing, annotating and manipulating Adobe pdf files for inserting the Contractor's review stamp, clouding and adding notation to the files as necessary for review by the Engineer.

1.05 CONTRACTOR RESPONSIBILITY

- A. Provide all the equipment, internet connections, software, personnel and expertise required to support the use of eBuilder as described in the Contract documents.

1.06 PORT RESPONSIBILITY

- A. Provide the Contractor with the following:
 - 1. All forms necessary for application to obtain permissions to access eBuilder® as described above.
 - 2. Information, basic user guides and requirements on methods for using eBuilder®.
 - 3. Instruction for the Contractor's staff utilizing eBuilder.

4. The Contractor will have up to two (2) user accounts to access eBuilder.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 UTILIZATION OF EBUILDER®

- A. The Contractor shall provide required information in a timely manner that also supports the project schedule and meets the requirements of the Contract.
- B. The Contractor shall provide and maintain competent and qualified personnel to perform the various tasks required to support the work within eBuilder®.
- C. The Port will not be liable for any delays associated from the usage of eBuilder® including, but not limited to: slow response time, Port maintenance and off-line periods, connectivity problems or loss of information. Under no circumstances shall the usage of eBuilder® software be grounds for a time extension or cost adjustment to the contract.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Preliminary schedule.
- B. Construction progress schedule, bar chart type.
- C. Construction progress schedule, with network analysis diagrams and reports.

1.02 RELATED SECTIONS

- A. Section 01 10 00 - Summary
- B. Section 01 14 00 - Work Restrictions
- C. Section 01 30 00 - Administrative Requirements
- D. Contract Plans and Specifications

1.03 REFERENCE STANDARDS

- A. AGC (CPSM) - Construction Planning and Scheduling Manual; 2004.

1.04 SUBMITTALS

- A. Within 5 days after date of Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.
- B. If preliminary schedule requires revision after review, submit revised schedule within 3 days.
- C. Within 21 days after review of Contract Execution, submit draft of proposed complete schedule for review.
 - 1. Include written certification that major contractors have reviewed and accepted proposed schedule.
- D. Within 5 days after joint review, submit complete schedule.
- E. Submit updated schedule with each Application for Payment.
- F. Submit in accordance with Section 01 33 00

1.05 QUALITY ASSURANCE

- A. Scheduler: Contractor's personnel or specialist Consultant specializing in CPM scheduling with five years minimum experience in scheduling construction work of a complexity comparable to this Project

1.06 SCHEDULE FORMAT

- A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.
- B. Sheet Size: Multiples of 8-1/2 x 11 inches (216 x 280 mm).

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT SCHEDULE

- A. Prepare preliminary schedule in the form of a horizontal diagram with network diagram relationships shown.

3.02 CONTENT

- A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- B. Identify work of separate stages and other logically grouped activities.
- C. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
- D. Provide legend for symbols and abbreviations used.

3.03 NETWORK ANALYSIS

- A. Prepare network analysis diagrams and supporting mathematical analyses using the Critical Path Method.
- B. Illustrate order and interdependence of activities and sequence of work; how start of a given activity depends on completion of preceding activities, and how completion of the activity may restrain start of subsequent activities.
- C. Mathematical Analysis: Tabulate each activity of detailed network diagrams, using calendar dates, and identify for each activity:
 - 1. Activity description.
 - 2. Estimated duration of activity, in maximum 15 day intervals.
 - 3. Earliest start date.
 - 4. Earliest finish date.
 - 5. Actual start date.
 - 6. Actual finish date.
 - 7. Latest start date.
 - 8. Latest finish date.
 - 9. Critical path clearly shown
 - 10. Free float; float time shall accrue jointly to the Port and Contractor for the Port's and Contractor's benefit.
 - 11. Percentage of activity completed.

3.04 REVIEW AND EVALUATION OF SCHEDULE

- A. Participate in joint review and evaluation of schedule with Consultant at each submittal.
- B. Evaluate project status to determine work behind schedule and work ahead of schedule.
- C. After review, revise as necessary as result of review, and resubmit within 7 days.

3.05 UPDATING SCHEDULE

- A. Maintain schedules to record actual start and finish dates of completed activities.
- B. Indicate progress of each activity to date of revision, with projected completion date of each activity.
- C. Indicate changes required to maintain Date of Substantial Completion.

END OF SECTION

PART 1 - GENERAL

1.01 RELATED WORK DESCRIBED ELSEWHERE

- A. The provisions and intent of the Contract, including the General Conditions apply to this work as if specified in this section. Work related to this section is described throughout these Specifications
- B. Individual submittals required in accordance with the pertinent sections of these specifications. Other submittals may be required during the course of the project and are considered part of the normal work to be completed under the Contract.

1.02 SUBMITTAL LOG

- A. Contractor shall, within 14 prepare and submit for Engineer approval a detailed log of all the submittals required under this Contract, along with any other submittals identified by the Port or Contractor. The log shall include, but not be limited to, schedules, required construction work plans, equipment and material cut sheets, shop drawings, project record documents, test results, survey records, record drawings, results of QC testing, and all other items for which a submittal is required. The submittal log shall be organized by CSI Specification Division, and Section number and include the following information:
 - 1. Submittal Number
 - 2. Item identification.
 - 3. After the submittal log is reviewed and approved by the Engineer, it shall become the basis for the submittal of all items by Contractor.
 - 4. The contractor shall identify any submittals that are missing from the specification or they believe are not required, for the approval of the Engineer. Submittals missing from the specification for materials that will be incorporated into the project does not waive the Contract's responsibility to provide submittal prior to the relevant work unless specifically noted in the Contract Documents,
 - 5. Submittal log after approval by the engineer shall be imported into Ebuilder submittal register to facilitate submission of submittal packages. The following information is required to facilitate import
 - a. Title - title of the submittal: such as, catch basin, or metal frame and grate.
 - b. Description: Title of the specification section: 33 40 00 Storm Drainage Utilities
 - c. Specification section: such as, 33 40 00
 - d. Sub Section. such as 2.02A (catch basins), and 2.02B (metal frame and grate), etc.
 - e. Category; such as Administrative submittal, as-builts, calculations, certifications, close out, disposal receipts, extra materials, operation/maintenance manual, product data, samples, shop drawings, test and inspection reports, warranties and work plans. These field are defined in Ebuilder.
 - f. Responsible Sub/Manufacture is to be completed if package is from a single supplier.
 - g. The number for the submittal and the package number will be assigned by Ebuilder upon import and when packages are submitted
 - h. The contractor when submitting submittals, may include a package name that corresponds to the specification section if complete or supplier.

- i. Dates of target submittals maybe provided by the Contractor as needed.
- 6. After the submittal log is available in E-builder, the Contractor shall complete the following field for each package. In all cases, individual submittals in the package shall be included in the package per the submittal register or added if needed in the submittal register. Packages can not include submittals from different sections of the specification. Partial submittal from multiple suppliers in one specification can be submitted in separate packages.
 - a. The Title of the package shall be the specification section and title, such as 01 35 29 - Health Safety and Emergency Response
 - b. The Description shall be the description of the submittal, such as Spill prevention plan.
 - c. Package number will be the Specification Section number, such as 01 35 29
 - d. If the submittals package is from a single supplier, list the company under Trade.

1.03 COMPLIANCE

- A. Failure to comply with these requirements shall be deemed as the Contractor's agreement to furnish the exact materials specified or materials selected by the Engineer based on these specifications.

1.04 SHOP DRAWINGS AND MANUFACTURERS' LITERATURE

- A. The Port will not accept shop drawings that prohibit the Port from making copies for its own use.
- B. Shop drawings shall be prepared accurately and to a scale sufficiently large to indicate all pertinent features of the products and the method of fabrication, connection, erection, or assembly with respect to the work.
- C. All drawings submitted to the Engineer for approval shall be drawn to scale as ANSI D
- D. Required electronic formats for these drawings are as follows:
 - 1. AutoCAD DWG
 - 2. PDF - Formatted to print to half-scale using 11x17 paper.
- E. Catalog cuts or brochures shall show the type, size, ratings, style, color, manufacturer, and catalog number of each item and be complete enough to provide for positive and rapid identification in the field. General catalogs or partial lists will not be accepted. Manufacturers' original electronic files are required for submitting.

1.05 SUBMITTAL REVIEW

- A. After review of each of Contractor's submittals, the submittal will be returned to Contractor with a form indicating one or more of the following:
 - 1. No Exceptions Taken - Means, accepted subject to its compatibility with future submittals and additional partial submittals for portions of the work not covered in this submittal. But it does not constitute approval or deletion of specified or required items not shown in the partial submittal.
 - 2. Make Corrections Noted - Same as Item 1, except that minor corrections as noted shall be made by Contractor.

3. Reviewed - Submittal has been reviewed by the port. Does not constitute approval and the Contractor is responsible for requirements in submittal.
 4. Review as Noted - Submittal has to be reviewed by the Port with comments as noted.
 5. Revise and Resubmit - Means, rejected because of major inconsistencies or errors. Resolve or correct before next submittal.
- B. Submittals marked "No Exceptions Taken" or "Reviewed as Noted" authorizes Contractor to proceed with construction covered by those data sheets or shop drawings with corrections, if any, incorporated. Submittals marked, "Make Corrections Noted", the Contractor may proceed with construction covered by those submittals, but must submit a conformed submittal complete with review comments.
- C. When submittals or prints of shop drawings have been marked "Revise and Resubmit" or "Rejected-," Contractor shall make the necessary corrections and submit required copies. Every revision shall be shown by number, date, and subject in a revision block, and each revised shop drawing shall have its latest revision numbers and items clearly indicated by clouding around the revised areas on the shop drawing.
- D. Submittals authorized by the Engineer do not in any case supersede the Contract Documents. The approval by the Engineer shall not relieve the Contractor from responsibility to conform to the Drawings or Specifications, or correct details when in error, or ensure the proper fit of parts when installed. A favorable review by the Port of shop drawings, method of work, or information regarding material and equipment Contractor proposes to furnish shall not relieve Contractor of its responsibility for errors therein and shall not be regarded as assumption of risk or liability by the Port or its officers, employees, or representatives. Contractor shall have no claim under the Contract on account of failure or partial failure, or inefficiency or insufficiency of any plan or method of work, or material and equipment so accepted. Favorable review means that the Port has no objection to Contractor using, upon its own full responsibility, the plan or method of work proposed, or furnishing the material and equipment proposed.
- E. It is considered reasonable that the Contractor's submittals shall be complete and acceptable by at least the second submission of each submittal. The Port reserves the right to deduct monies from payments due Contractor to cover additional costs for review beyond the second submission.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 PREPARATION OF SUBMITTALS

- A. The Contractor shall use the eBuilder software to submit all shop drawings, catalog cuts, brochures and other submittals including samples which must be hand-delivered. Notes, clouding, arrows or other post document generation notations must be applied directly into the electronic file using software designed for that purpose. **Each submittal shall be accompanied by a transmittal developed within the eBuilder software.**
- B. A **separate submittal** shall be prepared for each product, procedure of other submittal requirements under each section and shall be further identified by referencing the Specification Section and paragraph number and each submittal shall be numbered consecutively. An example of the numbering protocol is given here for an Electrical Submittal "26 05 33-001 - PVC Schedule 80 Conduit". If something is rejected and needs resubmitted it gets resubmitted with the same number adding an Revision no 1, et cetera, but the submittal number stays the same ALWAYS.

- C. Product submittals that cannot be accomplished electronically shall be accompanied by a printed version of the transmittal. These submittals will be hand delivered to the Port offices at One Sitcum Plaza, Attention: Engineering Department and posted on the Port's ftp site, <https://webftp.portoftacoma.com/WebInterface/login.html>; username: parcel77; password: P@rcel77.
- D. Shop and detail drawings shall be submitted in related specification sections as separate submittals and at the same time if possible. All equipment or material details which are interdependent or are related in any way must be coordinated indicating the complete installation. Submittals shall not be altered once marked "No Exceptions Taken" Revisions shall be clearly marked and dated. Major revisions must be re-submitted for approval.
- E. The Contractor shall thoroughly review all shop and detail drawings, prior to submittal, to assure coordination with other parts of the work.
- F. The Contractor shall be at risk for any components or materials which require submittals and which arrive at the job site prior to approval of shop drawings shall be subject to rejection and removal from the premises.
- G. All submittal packages including (but not limited to) product data sheets, mix designs, shop drawings and other required information for submittal must be submitted, reviewed and approved before the relevant scheduled task may commence. It is the responsibility of the Contractor to provide the submittal information which may drive a task on the construction schedule to submit items well enough in advance as to provide adequate time for review and comment from the Engineer without adversely impacting the construction schedule.
- H. When completing the eBuilder submittal form, a Date Due field is required to be completed. This field is intended to inform the Port of the urgency of the submittal. Failure of the Port to return the submittal by the date provided by the Contractor determined unreasonable, will not be considered grounds for a contract time extension.

3.02 MAINTENANCE OF SUBMITTAL LOG

- A. Prepare and submit for Port review a detailed submittal log conforming to the requirements of paragraph 1.02 of this section. When approved by the Engineer use the submittal log to track the transmittal of submittals to the Engineer, the receipt of submittal comments from the Engineer, and all subsequent action with respect to each submittal.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. The work includes the requirements for health and safety provisions necessary for all work at the site for this project. The work also includes compliance with all laws, regulations and ordinances with respect to safety, noise, dust, fire and police action, civil disobedience, security or traffic.
- B. Some of the work tasks may place workers in the potential position of coming into contact with regulated building materials, waste, or environmental media. Detailed information regarding the known nature and extent of refuse and regulated materials in the project area is included in Section 00 31 26 Existing Hazardous Material Information.
- C. The Contractor shall monitor site conditions for indications of identified and other potentially hazardous, dangerous, and/or regulated materials (suspicious material). Indicators of suspicious material include, but are not limited to, refuse, oily sheen or coloring on soil or water, or oily or chemical odors. If suspicious materials are encountered, the Contractor shall stop all work in that area and notify the Engineer immediately.
- D. This project is a Washington State Department of Ecology (Ecology) Remedial Action, subject to Ecology oversight.

1.02 SUBMITTALS

- A. Prior to the start of any Work, the Contractor shall provide a site specific Health and Safety Plan (HASP), which meets all the requirements of local, state and federal laws, rules and regulations. The HASP shall address all requirements for general health and safety and shall include but not be limited to:
 - 1. Description of work to be performed and anticipated chemical and/or physical hazards associated with the work.
 - 2. Map of the site(s) illustrating the location of the anticipated hazards and areas of control for those hazards (including containments, exclusion/work zones, and contaminant reduction/decontamination zones).
 - 3. Hazardous material inventory and safety data sheets (SDSs) for all chemicals which will be brought on site.
 - 4. Signage appropriate to warn site personnel and visitors of anticipated site hazards.
 - 5. Documentation that the necessary workers have completed the required Hazardous Waste Operations and Emergency Response (HAZWOPER) training.
 - 6. Engineering controls/equipment to be used to protect against anticipated hazards.
 - 7. Personal protective equipment and clothing including head, foot, skin, eye, and respiratory protection.
 - 8. Procedures which will be used for:
 - a. Lockout/Tagout;
 - b. Fall protection;
 - c. Trenching and shoring;
 - d. Hot work;
 - e. Oxygen deficient conditions;

- f. Asbestos and lead hazards;
 - g. Suspicious materials and/or unidentified materials;
 - h. Confined-space entry (could include dewatering storage tanks, manholes, or other items);
 - i. Confined-space rescue;
 - 9. Site housekeeping procedures and personal hygiene practices.
 - 10. Personnel and equipment decontamination plan.
 - 11. Administrative controls.
 - 12. Emergency plan including locations of and route to nearest hospital.
 - 13. Medical surveillance program for site personnel before, during, and after completion of site work.
 - 14. Recordkeeping including:
 - a. Documentation of appropriate employee training (e.g., Hazardous Waste Operations and Emergency Response [HAZWOPER] 40-hour training for staff involved with excavation and handling of soil)
 - 15. Name and qualification of person preparing the HASP and person designated to implement and enforce the HASP.
 - 16. Name and qualifications for Certified Safety Professional (CSP) or Certified Industrial Hygienist (CIH) and a copy of the CIH's or CSP's certification and resume.
 - 17. Excavation, stockpiling, and truck loading procedures.
 - 18. Lighting and sanitation.
 - 19. Signatory page for site personnel to acknowledge receipt, understanding, and agreement to comply with the HASP.
- B. Prior to the start of any Work, the Contractor shall provide a site specific Spill Prevention, Control and Countermeasures (SPCC) Plan, which meets all the requirements of local, state and federal laws, rules and regulations.
- C. Contractor may submit the HASP and SPCC Plan as one comprehensive document or may submit the plans as separate documents.

1.03 POTENTIAL CHEMICAL HAZARDS

- A. Site Contaminants
- 1. The Contractor must provide site workers with Hazard Communication standard information for potential site contaminants (in accordance with WAC 296-843). The Contractor shall ensure that all site workers are aware of and understand this information. Additional information shall also be provided by the Contractor, as necessary, to meet the Hazard Communication Standard and HASP requirements as noted in WAC 296-901-14010 and 296-843. Workers shall be instructed on basic methods or techniques to assist in detecting suspicious material.
- B. Chemical hazards may also result from Contractor operations resulting in inadvertent release of fuel, oil, or other chemicals in a manner that would expose workers.

1.04 POTENTIAL PHYSICAL AND OTHER HAZARDS

- A. The Work of the Contractor is described elsewhere in these specifications. Precautions to prevent all anticipated physical and other hazards, including heavy equipment; shall be addressed in the HASP.
- B. Specific aspects of construction resulting in physical hazards anticipated for this project include, but are not limited to the following:
 - 1. Work over or adjacent to water, presenting hazards of falling into water, hypothermia from exposure to the elements, and drowning.
 - 2. Operation of marine equipment, including winches, dredges, and related equipment, entrapment, ensnarement, and being struck by moving parts hazards
 - 3. Major hazards associated with earthwork impacts from moving construction vehicles and trucks, noise, thermal stress, contact with unguarded machines, excavation hazards (i.e., cave-in, utility, etc.), strains from heavy lifting, and reduced visibility and communications difficulties in work area.
 - 4. Operation of equipment, including excavators, loaders, and related equipment, presenting hazards of entrapment, ensnarement, and being struck by moving parts.
- C. Other anticipated physical hazards:
 - 1. Heat stress, such as that potentially caused by impermeable clothing (may reduce the cooling ability of the body due to evaporation reduction).
 - 2. Cold stress, such as that potentially caused during times when temperatures are low, winds are high, especially when precipitation occurs during these conditions.
 - 3. Biological hazards, such as mold, insect stings, or bites, poisonous plants (i.e., poison oak, sumac, etc.).
 - 4. Trips and falls

PART 2 - PRODUCTS

2.01 SAFETY SIGNAGE

- A. The Contractor shall provide signage at strategic locations within the project site to alert jobsite workers and visitors of the remediation work, associated hazards, and required precautions.

2.02 PRODUCTS SPECIFIED FOR HEALTH AND SAFETY

- A. Provide the equipment and supplies necessary to support the work as described in the site-specific HASP. Equipment and supplies may include but are not limited to:
 - 1. All chemicals to be used on site;
 - 2. A hazardous materials inventory and SDSs for the chemicals brought on site;
 - 3. Enclosure equipment (for dust and asbestos fiber control);
 - 4. Fencing and barriers;
 - 5. Warning signs and labels;
 - 6. Trenching equipment;
 - 7. Fire extinguishers;

8. Equipment to support hot work;
9. Equipment to support lockout/tagout procedures;
10. Scaffolding and fall protection equipment;
11. Personal protective equipment (hard hats, foot gear, skin, eye, and respiratory protection);
12. Area and personnel exposure monitoring equipment;
13. Demolition equipment and supplies;
14. Decontamination equipment and supplies;
15. First aid equipment;
16. Spill response and spill prevention equipment; and
17. Field documentation logs/supplies

PART 3 - EXECUTION

3.01 WORK AREA PREPARATION

- A. Contractor shall comply with health and safety rules, regulations, ordinances promulgated by the local, state, and federal government, the various construction permits, and other sections of the Contract Documents. Such compliance shall include, but not be specifically limited to: any and all protective devices, equipment and clothing; guards; restraints; locks; latches; switches; and other safety provisions that may be required or necessitated by state and federal safety regulations. The Contractor shall determine the specific requirements for safety provisions and shall have inspections and reports by the appropriate safety authorities to be conducted to ensure compliance with the intent of the regulations.
- B. Contractor shall inform employees, subcontractors and their employees of the potential danger in working with any potentially regulated materials, equipment, soils and groundwater at the project site.
 1. The Contractor shall not proceed with jobsite activities that might result in exposure of employees to hazardous materials until the HASP is reviewed by the Engineer.
 2. In addition, the Engineer will submit a copy of the Contractor's HASP to Ecology for review. Ecology and the Engineer will review but not approve HASP.
- C. All Contractor employees expected to work at the jobsite or individuals entering the jobsite shall read the Contractor HASP before they enter the jobsite, and will sign a statement provided by the Contractor that they have read and understand the HASP. A copy of the Contractor's HASP shall be readily available at the site at all times the work is being performed.
- D. Contractor shall perform whatever work is necessary for safety and be solely and completely responsible for conditions of the job site, including safety of all persons (including employees of the Engineer, Engineer's Representative, and Contractor) and property during the Contract period. This requirement applies continuously and is not limited to normal working hours.
- E. The Engineer's review of the Contractor's performance does not include an opinion regarding the adequacy of, or approval of, the Contractor's safety supervisor, the site-specific HASP, safety program or safety measures taken in, on, or near the job site.
- F. Accidents causing death, injury, or damage must be reported immediately to the Engineer and the Port Security Department in person or by telephone or messenger. In addition, promptly report in writing to the Engineer all accidents whatsoever arising out of, or in connection with,

the performance of the work whether on, or adjacent to, the site, giving full details and statements of witnesses.

- G. If a claim is made by anyone against the Contractor or any subcontractor on account of any accident, the Contractor shall promptly report the facts in writing within 24 hours after occurrence, to the Engineer, giving full details of the claim.

3.02 SITE SAFETY AND HEALTH OFFICER

- A. Contractor shall provide a person designated as the Site Safety and Health Officer, who is thoroughly trained in rescue procedures, has a minimum current 40-hour HAZWOPER certification (minimum), and trained to use all necessary safety equipment, air monitoring equipment, and gas detectors. The person must be available and/or present at all times while work is being performed, and conduct testing, as necessary.
- B. The Site Safety and Health Officer shall be empowered with the delegated authority to order any person or worker on the project site to follow the safety rules. Failure to observe these rules is sufficient cause for removal of the person or worker(s) from this project.
- C. The Site Safety and Health Officer is responsible for determining the extent to which any safety equipment must be utilized, depending on conditions encountered at the site.

3.03 SPILL PREVENTION AND CONTROL

- A. The Contractor shall be responsible for prevention, containment and cleanup of spilling petroleum and other chemicals/hazardous materials used in the Contractor's operations. All such prevention, containment and cleanup costs shall be borne by the Contractor.
- B. The Contractor is advised that discharge of oil, fuel, other petroleum, or any chemicals/hazardous materials from equipment or facilities into state waters or onto adjacent land is not permitted under state water quality regulations.
- C. In the event of a discharge of oil, fuel or chemicals/hazardous materials into waters, or onto land with a potential for entry into waters, containment and cleanup efforts shall begin immediately and be completed as soon as possible, taking precedence over normal work. Cleanup shall include proper disposal of all spilled material and used cleanup materials.
- D. The Contractor shall, at a minimum, take the following measures regarding spill prevention, containment and cleanup.
 - 1. Fuel hoses, lubrication equipment, hydraulically operated equipment, oil drums and other equipment and facilities shall be inspected regularly for drips, leaks or signs of damage, and shall be maintained and stored properly to prevent spills. Proper security shall be maintained to discourage vandalism.
 - 2. All land-based chemical, oil and products' storage tanks shall be diked, contained and/or located so as to prevent spills from escaping into the water. Dikes and containment area surfaces shall be lined with impervious material to prevent chemicals or oil from seeping through the ground and dikes.
 - 3. All visible floating sheen shall be immediately contained with booms, dikes or other appropriate means and removed from the water prior to discharge into state waters. All visible spills on land shall be immediately contained using dikes, straw bales or other appropriate means and removed using sand, sawdust or other absorbent material, which shall be properly disposed of by the Contractor. Waste materials shall be temporarily stored in drums or other leak-proof containers after cleanup and during transport to disposal. Waste materials shall be disposed offsite in accordance with applicable local, state and federal regulations.

4. In the event of any oil or product discharges into public waters, or onto land with a potential for entry into public waters, the Contractor shall immediately notify the Port Security at their listed 24-hour response number:
 - a. Port Security: 253-383-9472
- E. The Contractor shall maintain the following materials (as a minimum) at each of the project sites:
 1. Oil-absorbent booms: 100 feet.
 2. Oil-absorbent pads or bulk material, adequate for coverage of 200 square feet of surface area.
 3. Oil-skimming system.
 4. Oil dry-all, gloves and plastic bags.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section discloses procedures to follow if unknown regulated materials are encountered.

1.02 NOTIFICATION AND SUSPENSION

- A. In the event the Contractor detects the presence of potentially regulated materials not previously identified in this specification, the Contractor shall stop work and immediately notify the Port. Following such notification by the Contractor, the Port shall in turn notify the various governmental and regulatory agencies concerned with the presence of regulated materials, if warranted. Depending upon the type of materials identified, the Port may suspend work in the vicinity of the discovery under the provisions of General Conditions.
1. Following completion of any further testing necessary to determine the nature of the materials involved, the Port will determine how the material shall be managed. Although the actual procedures used in resuming the work shall depend upon the nature and extent of the regulated material, the following alternate methods of operation are foreseen as possible:
 - a. Contractor to resume work as before the suspension.
 - b. Contractor to move its operations to another portion of the work until measures to eliminate any hazardous conditions can be developed and approved by the appropriate regulatory agencies.
 - c. The Port to direct the Contractor to dispose or treat the material in an approved manner.
 - d. The Port to terminate or modify the Contract accordingly, for unforeseen conditions.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. Soils that cannot be reused on-site and are anticipated to be exported to an off-site facility must have a completed soil profile prior to export. Contractor is responsible for collecting the appropriate data that satisfies the requirements of the receiving facility.
- B. Soils excavated within the project area, as shown on the drawings, are anticipated to be free of regulated material; however, should the Contractor identify soil that cannot be reused as part of the project, the Contractor shall notify the Engineer to determine if the soil requires special handling.
 - 1. Soil with unexpected regulated material, as identified by visual and/or olfactory methods, shall be segregated from other excavated material until such time as appropriate testing and analysis can be completed by the Port. Upon completion of the soil profile, the Engineer will inform the Contractor of any special handling requirements based on the results.
 - 2. Soil beyond construction excavation limits will not require excavation unless free draining product is observed or other special conditions exist; in which case the Engineer will direct the Contractor in additional excavation. Soils determined to require special handling will be hauled and disposed of at an approved disposal facility.
- C. No soil shall be removed from the site without prior notification to the Engineer. The notification shall include:
 - 1. An estimate of the number of truck-trips, the haul destination, and the period in which these trips will be made (e.g., 20 truck-trips to the Waste Management Facility over the two-week period beginning on March 1, 2012).
- D. **The Contractor shall comply with all requirement set forth in the "Materials Management Plan, Port of Tacoma former Kaiser Aluminum Property, dated July 15, 2015." See Appendix C.**

1.02 DEFINITIONS

- A. Olfactory Indications (methods): Of or relating to the sense of smell. Soils containing petroleum and other volatile constituents typically exhibit characteristic odors that can be detected (and sometimes identified) by smell.
- B. Regulated Material: Any chemical, physical, biological, or radiological substance that does not occur naturally in the environment, or that occurs at concentrations higher than natural background levels, and is regulated by agencies as to the disposal/recycling facility(ies) the material can and cannot go (i.e., EPA, Department of Ecology, Tacoma-Pierce County Health Department).
- C. Soil (waste) Profile: A characterization of the chemical and physical properties of soil material designated for off-site disposal, including the presence of pollutants and their concentrations as measured by approved laboratory analytical methods. A profile is required by the receiving permitted disposal or recycling facility.
- D. Special Handling: Refers to hauling and disposal of soils that cannot be reused in place as backfill or as general fill at another (off-site) location due to the presence of pollutants in concentrations above allowable limits. Such soils must be hauled to and managed at a permitted disposal facility.

- E. Type A Regulated Soil: Soil that must be removed from the Project site and has been determined by the Engineer to contain pollutants in concentrations that exceed state or federal dangerous or hazardous designations (respectively), or other special Port-determined criteria. Type A Regulated Soil requires disposal at an approved Subtitle C hazardous waste landfill.
- F. Type B Regulated Soil: Soil that must be removed from the Project site and has been determined by the Engineer to contain pollutants in concentrations that are below dangerous or hazardous levels, but could negatively impact the quality of air, waters of the state, soils or sediments, or pose a threat to the health of humans or other living organisms, depending on where the soil is disposed. Type B Regulated Soil requires disposal an approved Subtitle D solid waste landfill.
- G. Type C Regulated Soil: Soil that must be removed from the Project site and has been determined by Engineer to contain unknown constituent(s) and/or in unknown concentration(s) and requires further analysis and characterization. Type C Regulated soil will require disposal at an approved Subtitle C hazardous waste landfill or Subtitle D solid waste landfill if additional soil characterization indicates special handling is required.
- H. Type D Soil: Soil determined by the Engineer not to require special handling with regard to this Contract. Classification of material as Type D Soil by the Port is not a certification nor does it release the Contractor of liability or obligation to meet any disposal or storage facility acceptance or testing requirements.
- I. Unexpected Regulated Material: Regulated material unexpectedly found in an excavation or in other locations where there is no prior knowledge, information, or history to indicate possible spills or releases of regulated material.
- J. Visual Indications (methods): A preliminary evaluation of the potential presence of contamination based on visual observation. For example, soils containing petroleum are frequently discolored or stained relative to non-petroleum impacted native soils or clean fill.

1.03 HEALTH AND SAFETY

- A. The Contractor is required to implement all health and safety provisions as required by Specification 01 35 29 – Health, Safety and Emergency Response. These provisions include any special monitoring, personal protective equipment, or work plans to accommodate regulated soil or material special handling. Use of environmental characterization data may not be appropriate for health and safety purposes.

1.04 SUBMITTALS

- A. **The Contractor shall not proceed with any excavation of any subsurface materials, prior to the Contractor approved submittal of the Soils Management Plan. The soils management plan shall be reviewed by Ecology.** The Contract will provide a minimum of 14 day for the submittal to be reviewed prior to excavation. The Soils Management Plan must be approved by the Engineer prior to any excavation of subsurface materials. The Soils Management Plan must include the following:
 - 1. **Soil management plan consistent with the "Materials Management Plan" in the Appendix C shall be implemented.**
 - 2. Identification of all soil disposal facilities anticipated to be used for soils that are determined to be Type A or Type B Regulated Soil.

3. Identification of all fill sites, disposal/recycling facilities and/or end uses anticipated to be used for soil determined to be Type D Soil in accordance with paragraph 3.02 of this section.
4. Contingency for delivery and placement of Type C Regulated Soil at an on-site soil stockpile area.
5. Contingency for managing soil/debris encountered during excavation that may disqualify soil for disposal or recycle at the anticipated facilities.
6. General description of how equipment operators, safety staff and other applicable on-site personnel will identify and respond to soil containing potentially regulated material.
7. Contractor shall coordinate with the Engineer to facilitate handling of regulated soil in accordance with this specification.
8. Description of all haul routes to be used on the project.

- B. A completed soil profile prior to export to an off-site receiving facility.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 EXCAVATION/TESTING

- A. The field-testing for soil to be exported offsite will be performed by the Port and will result in the following classification of material:
1. Type A Regulated Soil as defined in 1.02(E) of this Section
 2. Type B Regulated Soil as defined in 1.02(F) of this Section
 3. Type C Regulated Soil as defined in 1.02(G) of this Section
 4. Type D Soil as defined in 1.02(H) of this Section
- B. Contractor shall give Port no less than 21 days notice to sample export soil prior to disposal offsite.
- C. Laboratory turnaround times may require additional time for analytical results; therefore, Contractor should coordinate with Engineer well in advance of anticipated disposal date. Samples that are required to have "rush" analysis performed due to the Contractor's failure to disclose the anticipated disposal date shall have the difference in service fees paid by the Contractor, or the Contractor may delay the disposal until the standard analysis turnaround time is complete, at no additional cost to the Port.

3.02 TRANSPORTATION AND OFF-SITE DISPOSAL OF SOILS

- A. The Contractor shall be responsible for handling, re-handling, loading, transporting, and legal off-site removal of all waste materials and excavated soils not reused on-site.
1. Contractor shall ensure that transport truck gross weight meets federal and/or state Department of Transportation (DOT) requirements and the requirements of the receiving facility, whichever is more stringent.
 2. Contractor shall take measures to prevent debris from being spilled from trucks or tracked from the site to local streets. Contractor shall sweep streets adjacent to the site as necessary or as directed by the Engineer.

3. Contractor shall ensure that any vehicle transporting materials offsite are properly labeled and placarded in accordance with federal and state DOT requirements.
- B. Type A Regulated and Type B Regulated Soil shall be hauled to an approved facility by the Contractor for disposal.
- C. Type C Regulated Soil is of unknown origin or special circumstances. Type C Regulated Soil shall be hauled to an on-site segregated stockpile area. The Contractor shall protect the material from weather and other disturbances once stockpiled. The Port will inform the Contractor of the soil profile following additional analysis of the suspect material (as needed), and the soil will be categorized as either Type A Regulated, Type B Regulated or Type D Soil and disposed of accordingly.
- D. Type D Soil that is not reused on-site shall be hauled by the Contractor to a site determined by the Contractor. If the receiving/disposal facility requires additional testing or certification of this soil, Contractor shall complete these requirements, at no additional cost to the Port. The Port will not certify or declare the material suitable for unrestricted use.

3.03 OTHER REQUIREMENTS

- A. Type A, Type B or Type C Regulated Soil may be, upon approval of the Engineer, temporarily stockpiled within the construction area. Contractor shall place an impervious liner beneath the soil and securely cover the stockpile with waterproof covering (e.g., plastic sheeting). Additional measures (e.g., berm, jersey barriers, silt fence, etc.) may be required to minimize soil runoff from the stockpile area. The soil shall be removed prior to completion of Work.
- B. Contractor shall provide the Engineer with all hauling receipts (or copies of receipts) from the disposal facility for all Type A, Type B or Type C Regulated Soil at least weekly.
- C. The Engineer may shut down excavation activities should unexpected regulated material be encountered during excavation.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. The Work includes the requirements to provide air and noise control measures until Final Completion of the Work.

1.02 SUBMITTALS

- A. Prior to Notice to Proceed, the Contractor shall submit of a list of equipment to be used on the project and certify in writing that all equipment on the list and any additional equipment, including Contractor's, subcontractors or supplier's equipment, shall meet the requirements of 3.01 below.

PART 2 - PRODUCTS - NOT USED

PART 3 – EXECUTION

3.01 AIR POLLUTION CONTROL

- A. The Contractor shall meet or exceed EPA Tier 2 off-road diesel engine emission standards for off-road equipment \geq 25hp and meet or exceed EPA 1994 on-road diesel engine emission standards for on-road equipment except as follows:
 - 1. Equipment being used in an emergency or public safety capacity
- B. The Contractor shall not discharge smoke, dust, and other hazardous materials into the atmosphere that violate local, state or federal regulations.
- C. No vehicles can idle for more than 5 consecutive minutes, except as follows:
 - 1. Idling is required to bring or maintain the equipment to operating temperature;
 - 2. Engine idling is necessary to accomplish work for which the equipment was designed (i.e. operating a crane)
 - 3. Idling vehicles being used in an emergency or public safety capacity.
- D. The Contractor shall minimize nuisance dust by cleaning, sweeping, vacuum sweeping, sprinkling with water, or other means. Equipment for this operation shall be on the job site or available at all times.

3.02 NOISE CONTROL

- A. The Contractor shall comply with all local controls and noise level rules, regulations and ordinances which apply to work performed pursuant to the Contract.
 - 1. Construction activities are not planned to be performed outside of the time window set forth by the City of Tacoma's Noise Ordinance, (#27673, Chapter 8.112.080) which limits work between 9pm and 7am on weekdays; and between 9pm and 9am on Saturdays, Sundays, and legal holidays.
 - 2. Should there be a need for after-hours construction, the Contractor shall obtain a variance in accordance with local and state regulations.
- B. All internal combustion engines used on the job shall be equipped with a muffler of a type recommended by the manufacturer.
- C. Utilizing the best available noise abatement technology on construction equipment.

- D. Back up alarms can produce some objectionable sound, although they are exempt from the Washington State noise ordinance. It is recommended that vehicles drive forward as much as possible to avoid the use of the back-up alarm.
- E. Substitute hydraulic or electric models for impact tools such as rock drills or jackhammers, when feasible.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. The Work shall consist of the procedures to be followed in the event that cultural and/or historical resources are inadvertently discovered during the projects activities.
- B. The project is located in an area previously inventoried for cultural and historical resources; however it is possible that additional, previously unidentified archaeological resources and/or skeletal remains could be inadvertently discovered during project activities. In the event that prehistoric, historic-era archaeological materials or skeletal remains are discovered, the appropriate protection measures and protocols described in this section must be followed.

1.02 REFERENCES

- A. The rules, requirements, and regulations that apply to this Work include, but are not necessarily limited to the following:
 - 1. Port of Tacoma "Inadvertent Discovery Plan for the Port of Tacoma's Parcel 77 Auto Import Terminal Development Project, Tacoma, Washington, January 16, 2018" (IDP).

PART 2 - PRODUCTS - NOT USED.

PART 3 - EXECUTION

3.01 PROTOCOLS FOR DISCOVERY OF ARCHAEOLOGICAL RESOURCES

- A. In the event that archaeological resources are encountered within the project, the following actions will be taken:
 - 1. All ground disturbing and construction activity at the specific location will stop and the area will be protected via temporary fencing or other appropriate measures.
 - 2. The Contractor's work supervisor will be notified immediately.
 - 3. Contact the PORT's Engineer and Environmental Project Manager immediately.
 - 4. A work stoppage zone, as determined by the Archaeologist and PORT, will be established.
 - 5. The PORT's Environmental Project Manager will contact the appropriate agencies where the discovery is located as well as the Washington State Department of Archaeology and Historic Preservation (DAHP) the Puyallup Tribe (TRIBE) and the U.S. Army Corps of Engineers (Corp).
 - 6. The Work Stoppage Zone will remain protected until further decisions can be made regarding the area.
 - 7. The Contractor will be allowed to continue ground disturbing and other construction activities outside of the established work stoppage zone.

3.02 PROTOCOLS FOR DISCOVERY OF HUMAN REMAINS

- A. In the event of that human remains are encountered within the project, the following actions, consistent with RCWs 68.50.645, 27.44.055 and 68.60.055 will be taken:
 - 1. All ground disturbing and construction activity at the specific location will stop and the area will be protected via temporary fencing or other appropriate measures. The remains will not be touched, moved or further disturbed.
 - 2. The Contractor's work supervisor will be notified immediately.
 - 3. Contact the Port's Engineer and Environmental Project Manager immediately.

4. The Environmental Project Manager will notify the county medical examiner / coroner and local law enforcement.
5. A Work Stoppage Zone will be determined and remain protected until further decisions can be made regarding the area.
6. The Contractor will be allowed to continue ground disturbing and other construction activities outside of the established work stoppage zone.

3.03 PROTOCOLS FOR CONFIDENTIALITY

- A. In the event of that human remains or cultural resources are discovered within the project area, the Port and the Contractor shall keep and maintain all information regarding any discovery confidential.
 1. At no time shall the Contractor contact the media, any third party or otherwise share information regarding the discovery with any member of the public.
 2. If the Contractor is contacted by the media or the public regarding any discovery, they shall refrain from comment, and contact the Port's Environmental Project Manager immediately.

END OF SECTION

PART 1 - GENERAL

1.01 PERMITS, CODES AND REGULATIONS

- A. The following permits/approvals have been applied for (or are on file) and incorporated into the Contract: See Appendix E for permits in hand.
1. State Environmental Policy Act (SEPA) Compliance
 2. Shoreline Management Act / Critical Areas Compliance
 3. Hydraulic Code Compliance
 4. Section 401 and 404 of CWA and Section 10 of RHA Compliance
 5. Section 106 of NHPA Compliance
 6. Refer to Section 01 41 00, Regulatory Requirements and Section 01 57 13 TESC and Project SWPPP in the Appendix for additional permit obtained by the Port and permit requirements.
 7. Site Development Permit (SDEV18-0049) for construction of the auto terminal.
 8. Site Development Permit (SDEV18-0115) for construction of the new outfall and connection to the existing outfall on East Blair 1 pier included in Alternative 1 & 2 of the bid form.
 9. Work Order (RCON18-0037) for the entrance of Taylor Way.
 10. Work Order (RCON18-0038) for the entrance on Alexander.
 11. Work Order (WO18-0050) for the work in the Alexander right of way including the waterline crossing Alexander that is part of Alternate 1 and 2 in the bid form.
 12. Right of Way (ROCC18-0016) for the work on the waterline crossing Alexander that is part of Alternate 1 and 2 in the bid form.
 13. Demolition permits (DEMOC18-0011, DEMCO18-0012) for each of the building on site to be demolished.
 14. Special Authorization to Discharge to the City of Tacoma Municipal Sewer System, for construction dewatering.
 15. Environmental Cleanup documents directly related to this proposal include Washington State Department of Ecology (Ecology) Consent Decree No. 16-2-12406-8 and therein attached Cleanup Action Plan (CAP), which includes a Materials Management Plan (State of Washington 2016), and an Environmental (Restrictive) Covenant - Pierce County Recording No. 201704170625. Other existing environmental cleanup information, reports, and documents related to the Project property are listed in Ecology Consent Decree No. 16-2-12406-8 (State of Washington 2016) and Agreed Order DE-5698 (Ecology 2011). See Appendix A.
 16. Water Quality Monitoring and Protection Plan prepared to monitor compliance with Washington State Water Quality Standards, Chapter 173-201A of the Washington Administrative Code.
- B. The Contractor shall submit and get approval by the City a Traffic Control Plan and pedestrian accessible route plan and submit to the City a performance bond or assignment of funds prior to obtaining the Work order permits.

- C. Conform with the requirements of listed permits and additional or other applicable permits, codes, and regulations as may govern the Work.
- D. Obtain and pay fees for licenses, permits, inspections, and approvals required by laws ordinances, and rules of appropriate governing or approving agencies necessary for proper completion of Work (other than those listed under item 1.01A above and Special Inspections called for by the International Building Code). Permits the Contract must obtain and pay fees include, but are not limited to,
 - 1. Side sewer connection permits.
- E. Conform with current applicable codes, regulations and standards, which is the minimum standard of quality for material and workmanship. Provide labor, materials, and equipment necessary for compliance with code requirements or interpretations, although not specifically detailed in Drawings or specifications. Be familiar with applicable codes and standards prior to bidding.
- F. Process through Engineer, request to extend, modify, revise, or renew any of the permits (listed in 1.01.A above). Furnish requests in writing and include a narrative description and adequate Drawings to clearly describe and depict proposed action. Do not contact regulatory agency with requests for permit extensions, modifications, revisions, or renewals without the prior written consent of the Engineer.

1.02 VARIATIONS WITH CODES, REGULATIONS AND STANDARDS

- A. Nothing in the Drawings and specifications permits Work not conforming to codes, permits or regulations. Promptly submit written notice of the Engineer of observed variations or discrepancies between the Contract Documents and governing codes and regulations.
- B. Appropriate modifications to the Contract Documents will be made by Change Order to incorporate changes to Work resulting from code and/or regulatory requirements. Contractor assumes responsibility for Work contrary to such requirements if Work proceeds without notice.
- C. Contractor is not relieved from complying with requirements of Contract Documents which may exceed, but not conflict with requirements of governing codes.

1.03 COORDINATION WITH REGULATORY AGENCIES

- A. Coordinate Work with appropriate governing or regulating authorities and agencies.
- B. Provide advance notification to proper officials of Project schedule and schedule revisions throughout Project duration, in order to allow proper scheduling of inspection visits at proper stages of Work completion.
- C. Regulation coordination is in addition to inspections conducted by Engineer. Notify Engineer at least 48 hours in advance of scheduled inspections involving outside regulating officials, to allow Engineer to be present for inspections.

1.04 COORDINATION WITH WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

- A. Notify HPAapplications@dfw.wa.gov and Engineer at least 3 days prior to start of construction.
- B. Notify HPAapplications@dfw.wa.gov and Engineer within 7 days of completion of project. See Notification Requirement per provisions four of the Hydraulic Project Approval (HPA).

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Requirements relating to referenced standards.

1.02 QUALITY ASSURANCE

- A. For products or workmanship specified by reference to a document or documents not included in the Project Manual, 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 specified in this section, except where a specific date is established by applicable code.
- C. Should specified reference standards conflict with Contract Documents, request clarification from the Engineer before proceeding.
- D. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Engineer shall be altered by the Contract Documents by mention or inference otherwise in any reference document.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 QUALITY CONTROL FOR COMPLIANCE:

- A. All work described in the Contract Documents must be fully tested in accordance with applicable sections of these Specifications. The provisions and intent of the Contract, including the General Conditions, Supplementary Conditions and General Requirements, apply to this work as if specified in this Section.
- B. The Contractor shall perform such detailed examination, inspection and quality control and assurance of the Work as to ensure that the Work is progressing and is being completed in strict accordance with the Contract Documents. The Contractor shall plan and lay out all Work in advance of operations so as to coordinate all Work without delay or revision. The Contractor shall be responsible for inspection of portions of the Work already performed to determine that such portions are in proper condition to receive subsequent Work. Under no conditions shall a portion of Work proceed prior to preparatory work having been satisfactorily completed. The Contractor shall ensure that the responsible Subcontractor has carefully examined all preparatory work and has notified the Contractor (who shall promptly notify the Port in writing) of any defects or imperfections in preparatory work that will, in any way, affect completion of the Work.

1.02 QUALITY ASSURANCE - 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 Engineer 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. Perform Work 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, or disfigurement.

1.03 TOLERANCES

- A. Monitor fabrication and installation tolerance control of Products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.
- C. Adjust Products to appropriate dimensions; position before securing Products in place.

1.04 REFERENCES AND STANDARDS

- A. For Products or workmanship specified by association, trade, or other consensus 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 by date of issue current on date of Contract Documents, except where a specific date is established by code.
- C. Obtain copies of standards where required by product specification sections.
- D. Neither the contractual relationships, duties or responsibilities of the parties in Contract, nor those of the Engineer, shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.05 TESTING SERVICES

- A. Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities.
 - 1. Neither observations by an inspector retained by the Port, the presence or absence of such inspector at the site, nor inspections, tests, or approvals by others, shall relieve the Contractor from any requirement of the Contract Documents, nor is any such inspector authorized to change any term or condition of the Contract Documents.
- B. Necessary materials testing shall be performed by an independent testing laboratory during the execution of the Work and paid for by the Port of Tacoma, unless otherwise specified. Access to the area necessary to perform the testing and/or to secure the material for testing, shall be provided by the Contractor.
- C. Testing does not relieve Contractor to perform work to contract requirements.
- D. Re-testing required because of non-conformance to specified requirements shall be performed by the same independent firm. Payment for re-testing will be charged to the Contractor by deducting testing charges from the Contract Sum.
- E. Material testing for initial material approval will be performed by an independent, certified laboratory and paid for by the Contractor. These tests must be dated within six (6) months of the submittal date.
- F. Subsequent sampling and testing, required as the work progresses to ensure continual control of materials and compliance with all requirements of the Contract documents, shall be the responsibility of the Port, except as required by other sections of these Specifications.

1.06 MANUFACTURER'S 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, start-up equipment, test, and adjust and balance equipment as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Engineer 30 days in advance of required observations. Observer subject to approval of Engineer.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Temporary utilities.
- B. Temporary telecommunications services.
- C. Temporary sanitary facilities.
- D. Temporary Controls: Barriers, enclosures, and fencing.
- E. Field offices.

1.02 TEMPORARY UTILITIES

- A. Provide and pay for all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes.
- B. Use trigger-operated nozzles for water hoses, to avoid waste of water.

1.03 TELECOMMUNICATIONS SERVICES

- A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.
- B. Telecommunications services shall include:
 - 1. Windows-based personal computer dedicated to project telecommunications, with necessary software and laser printer.
 - 2. Telephone Land Lines: One line, minimum; one handset per line.
 - 3. Internet Connections: Minimum of one; DSL modem or faster.
 - 4. Email: Account/address reserved for project use.

1.04 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
- B. Maintain daily in clean and sanitary condition.
- C. At end of construction, return facilities to same or better condition as originally found.

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 to allow for Port's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.06 FENCING

- A. Provide fencing around construction site as show on the plans, equipped with vehicular gates with locks.

1.07 EXTERIOR ENCLOSURES

- A. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections,

and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.08 CONTRACTORS FIELD OFFICE

- A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack and drawing display table.
- B. Locate offices per the plans and specification and in coordination with other one site Contractors. Note, Contract trailer on site may have to be moved during construction to allow completion of the work.

1.09 TREE AND VEGETATION PROTECTION

- A. The Contractor shall carefully protect existing trees and vegetation noted to remain from damage by construction activities.
- B. All trees and vegetation noted to remain shall have 4' high, high visibility fence installed at the drip line of the tree or vegetation or as noted and shown on the Drawings.
- C. If a tree or vegetation designated for protection is damaged or destroyed in the course of the Work, the Contractor shall replace it with new comparable in species and size as required by the Engineer. Where it is necessary to replace trees or vegetation damaged by construction, the Contractor shall bear all expenses associated with replacement and establishment of the replacement vegetation.

1.10 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to final inspection.
- B. Remove any temporary underground installations
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore existing facilities used during construction to original condition.
- E. Restore new permanent facilities used during construction to specified condition.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Access roads.
- B. Parking.
- C. Construction parking controls.
- D. Traffic Control
- E. Flares and lights.
- F. Haul routes.
- G. Maintenance.
- H. Removal, repair.
- I. Mud from site vehicles.

PART 2 - PRODUCTS

2.01 SIGNS, SIGNALS, AND DEVICES

- A. Post Mounted and Wall Mounted Traffic Control and Informational Signs, as specified.
- B. Traffic Cones and Drums, Flares and Lights: As approved by local jurisdictions.
- C. Flag Person Equipment: As required by local jurisdictions.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Clear areas, provide surface and storm drainage of road, parking, area premises, and adjacent areas.

3.02 ACCESS TO SITE

- A. Provide unimpeded access for emergency vehicles. Maintain 20 foot (6 m) width driveways with turning space between and around combustible materials.
- B. Provide and maintain access to fire hydrants free of obstructions.

3.03 PARKING

- A. All Contractor's employee cars and work vehicles will be parked on-site as coordinated with the Engineer and other on-site contractors.
- B. When site space is not adequate, provide additional off-site parking.

3.04 CONSTRUCTION PARKING CONTROL

- A. Control vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles, and Port operations.
- B. Prevent parking on or adjacent to access roads or in non-designated areas.

3.05 TRAFFIC CONTROL

- A. Contract shall submit all required work order traffic control plans to the City of Tacoma for approval. Provide trained and equipped flag persons to regulate traffic when construction operations or traffic encroach on public traffic lanes.

- B. The Contractor shall erect and maintain all construction signs, warning signs, detour signs, flaggers and other traffic control devices necessary for the safe ingress and egress of the Project Site. Traffic control shall include but is not limited to:
 - 1. **Trained railroad flaggers** to direct traffic as required by Tacoma Rail to accommodate the Contractor's work. This is required for the stormwater line that passes under Tacoma Rail line west of Alexander
 - 2. The Contractor shall be liable for injuries and damages to persons and property suffered by reason of the Contractor's operations or any negligence in connection therewith.
 - 3. Flagging, signs, and all other traffic control devices furnished or provided shall conform to established WSDOT and City of Tacoma standards. No work shall be done on or adjacent to the above locations until all necessary signs and traffic control devices are in place. During the course of the work, the Contractor shall be responsible for providing and maintaining adequate traffic control measures for the protection of the Contractor's work and the public.

3.06 FLARES AND LIGHTS

- A. Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.

3.07 HAUL ROUTES

- A. Confine construction traffic to designated haul routes.
- B. Provide traffic control at critical areas of haul routes to regulate traffic, to minimize interference with public traffic.

3.08 MAINTENANCE

- A. Maintain traffic and parking areas in a sound condition free of excavated material, construction equipment, Products, mud, snow, and ice.
- B. Maintain existing paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original, or specified, condition.

3.09 REMOVAL, REPAIR

- A. Repair existing facilities damaged by use, to original condition.
- B. Repair damage caused by installation.

3.10 PUBLIC STREET AND ONSITE ROADWAY CLEANING

- A. The Contractor shall be responsible for preventing dirt and dust escaping from trucks and other vehicles operating on or departing the project site by sweeping, covering dusty loads, washing truck tires and all other reasonable methods, include Port, consultant, and other contractor vehicles.
- B. When trucks and other equipment are operating on paved public streets and site roadways/paved surfaces, the Contractor will be required to clean said streets, roadways and other paved surfaces at least daily, and at other times if required by the Engineer.

- C. In the event that the above requirements are violated and no action is taken by the Contractor after notification of infraction by the Engineer, the Port reserves the right to have the streets, roadways and other paved surfaces in question cleaned by others and the expense of the operation charged to the Contractor.

END OF SECTION

PART 1 - GENERAL

1.01 WORK DESCRIPTION

- A. The Work shall consist of planning, installing, inspecting, maintaining and removing Temporary Erosion and Sediment Control (TESC) Best Management Practices (BMPs) to prevent pollution of air and water; and to control, respond to, and dispose of eroded sediment and turbid water during the term of the Contract.
- B. These TESC requirements shall apply to all areas associated with the Work, including but not limited to the following:
 - 1. Work areas
 - 2. Equipment and material storage areas
 - 3. Staging areas
 - 4. Stockpiles
 - 5. Discharge points within or adjacent to the work areas that are impacted by stormwater runoff from the site.
- C. Acceptance of TESC plans does not constitute an approval of permanent Work or drainage design (e.g., size and location of roads, pipes, restrictors, channels, retention facilities, utilities, etc.).
- D. Contractor shall read and conform to all requirements set forth in Washington Department of Ecology's (Ecology) NPDES General Permit for Discharges Associated with Construction Activities (CSGP).

1.02 REFERENCES

- A. The rules, requirements, and regulations that apply to this Work include, but are not necessarily limited to the following:
 - 1. Washington Department of Ecology, "Stormwater Management Manual for Western Washington," 2014.
 - 2. Department of Ecology NPDES General Permit for Discharges Associated with Construction Activities, 2016.
 - 3. Washington State Department of Transportation 2012 Standard Specification M41-10, Division 8-01 Erosion Control and Water Pollution Control.
 - 4. City of Tacoma, "Surface Water Management Manual," Tacoma Public Works, Environmental Services, July 2016.

1.03 SUBMITTALS

- A. A Construction Stormwater Pollution Prevention Plan (SWPPP), as required by NPDES permit.
 - 1. Contractor may elect to adopt and comply with a Port project SWPPP, or provide an alternative project SWPPP. See Appendix D.
 - 2. Contractor shall be responsible for updating the project SWPPP during construction to reflect the required changes to BMPs, as needed, to comply with the CSGP at no additional cost to the Port.
- B. Safety Data Sheet (SDS) for any dust palliative product.

- C. A copy of all Contractor site inspection logs and monthly Discharge Monitoring Reports (DMRs).
- D. Water Management Plan/Temporary Dewatering Plan.

1.04 AUTHORITY OF ENGINEER

- A. The Engineer has the authority to limit the surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow and fill operations, as determined by analysis of project conditions; and to direct the Contractor to provide immediate permanent or temporary pollution control measures to minimize impacts to adjacent streams or other watercourses, lakes, ponds, and other areas of water impoundment.
- B. In the event that areas adjacent to the work area are suffering degradation due to erosion, sediment deposit, water flows, or other causes, the Engineer may stop construction activities until the Contractor rectifies the situation.

PART 2 - PRODUCTS

2.01 DUST CONTROL

- A. Dust palliative for dust control proposed by the Contractor and approved by the Engineer.

PART 3 - EXECUTION

3.01 GENERAL

- A. The Port has obtained the CSGP effective 5/14/2018. See Appendix G. The permit shall be transferred to the Contractor prior to ground disturbing activities. The Contractor shall be the responsible Operator/Permittee for the duration of the project.
- B. In the event of conflict between these requirements and pollution control laws, rules, or regulations of other federal, state, or local agencies, the more restrictive laws, rules, or regulations shall apply as determined by the Engineer.
- C. No project discharge of water shall be allowed that exceeds the regulated pollutant levels in Ecology's CSGP and any CSGP-associated Administrative Orders.
- D. Contractor shall be solely responsible for all BMP modifications and upgrades to comply with the CSGP and the requirements of this Section, at no additional cost to the Port.
- E. Contractor shall be solely responsible for any damages and fines incurred because of Contractor, subcontractor, or supplier actions in implementing the requirements of this Section.
- F. The Contractor shall be solely responsible for schedule impacts incurred because of Contractor, subcontractor, or supplier actions in implementing the requirements of this Section.

3.02 TEMPORARY EROSION AND SEDIMENT CONTROL DEVELOPMENT

- A. The Port has prepared a project SWPPP that complies with the CSGP requirements. The Port project SWPPP is attached to the end of this Section.
 - 1. The SWPPP shall describe construction activities and sequencing, and the proposed Temporary and Permanent Erosion and Sediment Control measures.
 - 2. The SWPPP shall consist of planning, installing, inspecting, maintaining, and removing TESC BMPs per Volume II of the Stormwater Management Manual for Western Washington (2014) or equivalent. The BMPs shown in the Drawings are the minimum required to prevent pollution of air and water, to control peak volumetric flow rates and

velocity of stormwater, and to control, respond to, and dispose of eroded sediment and turbid water during the term of the Contract.

3. If Contractor chooses to write a SWPPP separate from the Port-provided SWPPP, it must comply with all of the requirements set forth by the CSGP.
- B. Contractor shall develop project-specific TESC BMPs and incorporate them into the SWPPP. Contractor shall address the following issues as part of developing and implementing the BMPs.
 1. TESC BMPs must meet the requirements in Ecology's Volume II of the Stormwater Management Manual for Western Washington (2014) or equivalent.
 2. TESC notes and details shown in the Drawings and the information in this Section form a basis of the minimum requirements for a TESC Plan. Contractor shall develop a TESC Plan specific to the construction schedule and proposed means and methods prior to commencing construction activities for the duration of the Project.

3.03 TEMPORARY EROSION AND SEDIMENT CONTROL IMPLEMENTATION

- A. Contractor is responsible for implementing and updating the SWPPP including TESC BMPs.
 1. Contractor shall inspect the TESC measures daily and maintain these measures to ensure continued proper functioning for the duration of the Project.
 2. Contractor will be responsible for documenting TESC site inspections on a weekly basis in areas of active construction and on a monthly basis in areas that have undergone stabilization. Contractor shall keep records of the inspections on site.
 3. During the construction period the Contractor shall, at no additional cost to the Port, upgrade and/or maintain TESC measures as needed, based on Contractor means and methods, work sequencing, and changing site conditions (e.g., changes to impervious surface coverage, proximity of work to storm conveyance systems, storm events, etc.). Contractor shall modify these measures for changing site conditions and update the SWPPP to document all modifications made.
- B. Catch basins shall be cleaned when the depth of debris reaches 30% of the sump depth or the debris surface is six (6) inches below the outlet pipe. Contractor shall clean all catch basins, manholes, and conveyance lines, if present, prior to Work completion. The cleaning process shall not flush sediment-laden water into a downstream system.
- C. Contractor shall ensure that water, or a dust palliative and a dispensing subcontractor, if needed, is available for project use. It is the responsibility of the Contractor to develop and adhere to appropriate safety measures pertaining to the palliative use. This also includes ensuring the dispensing subcontractor develops and adheres to the appropriate safety measures, if a dispensing subcontractor is used. Water used for dust suppression shall not be applied at such a rate or in a location that it will generate runoff from the site.
- D. Areas of exposed soils, including embankments, which will not be disturbed for two days during the wet season (October 1 through April 30) or seven days during the dry season (May 1 through September 30), shall immediately be stabilized by the Contractor with an Ecology-approved TESC measure (e.g., seeding, mulching, plastic covering, etc.).
- E. TESC measures in an inactive area shall be inspected and maintained by the Contractor until the area is permanently stabilized.
- F. In the event that additional temporary erosion and pollution control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as a part of

the Work as scheduled or as ordered by the Engineer, such work shall be performed by the Contractor at its own expense.

- G. Contractor shall remove all TESC facilities, install permanent site surfacing improvements and permanent BMPs with minimal disturbance, and shall clean stormwater facilities prior to Work completion.
- H. Contractor shall terminate the CSGP upon final stabilization of the site.

END OF SECTION

PART 1 - GENERAL

1.01 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 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by the Contract Documents.

2.02 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

PART 3 - EXECUTION

3.01 TRANSPORTATION AND HANDLING

- A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- B. Transport and handle products in accordance with manufacturer's instructions.
- C. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- D. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
- F. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.02 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. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- G. Prevent contact with material that may cause corrosion, discoloration, or staining.
- H. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

PART 1 - GENERAL

1.01 SCOPE

- A. The purpose of this section is to provide the framework for transferring Port provided equipment and materials to the Contractor in a safe, timely and effective manner.

1.02 SUBMITTALS

- A. Submit an inspection report or log to the Engineer of the inspection performed on the equipment and materials before acceptance by the Contractor. Flag any equipment or materials identified as being in unsatisfactory condition before moving or relocating it from the Location Area described below. Document unsatisfactory condition of equipment photographically, using digital media.

1.03 COORDINATION

- A. The stormwater treatment concrete vaults materials will be available by August 1, 2018.
- B. The outdoor lighting equipment including poles and fixtures will be available by September 12, 2018, anchor bolts will be available July 16, 2018.

1.04 LOCATION

- A. All Port furnished materials are to be unloaded, stored and protected by the Contractor to the project site.

PART 2 - PRODUCTS

2.01 ITEMS

- A. For outdoor lighting equipment including poles and fixtures see Section 01 64 00 - Graybar material list attached to this section.
- B. Stormwater treatment concrete vaults

NO.	DESCRIPTION	QUANTITY	MANUFACTURER/SUPPLIER
1	TYPE 1 VAULTS	18	Oldcastle Precast
2	TYPE 2 VAULTS	8	Oldcastle Precast
3	TYPE 3 VAULTS	4	Oldcastle Precast

PART 3 - EXECUTION

3.01 RECEIPT OF MATERIAL

- A. Contractor shall conduct an immediate inspection of all received materials as they arrive, inventory the content of boxes and packages and notify the Engineer of any discrepancies and/or damaged materials.
- B. Protect, transport and install where indicated within the Contract Documents.

3.02 PROTECTION

- A. Equipment
 - 1. Contractor shall be fully responsible for the protection of Owner Furnished materials from their times of arrival until their incorporation into the Work, including unloading, inspection, inventory control and secure storage.

2. Tightly cover and protect equipment against dirt, moisture or impact, mechanical and chemical damage.
3. Repair
 - a. Repair or replace Port provided property damaged by the Contractor.

3.03 INSTALLATION

- A. Install in accordance with the Contract Documents.

3.04 FIELD QUALITY CONTROL

- A. Equipment Inspection
 1. Examine each piece or component for visual defects.
- B. Tests
 1. Test each piece or component to ensure that it is operational in conformance with the Contract Documents.

END OF SECTION



1414 CENTER ST
TACOMA WA 98409-8211
Phone: 253-779-3617
Fax: 253-779-3605

To: TACOMA PORT OF

Date: 04/04/2018

Attn:
Phone:
Fax:
Email:

Proj Name: Parcel 77

GB Project Qte#:

Release Nbr:

Purchase Order Nbr:

Additional Ref#

Valid From: 04/04/2018

Valid To: 05/04/2018

Contact:

Email:

Proposal

We Appreciate Your Request and Take Pleasure in Responding As Follows

Item	Item/Type	Quantity	Supplier	Catalog Nbr	Description	Price	Unit	Ext.Price
100	2 EA HOLOPHANE			HMLED3PK450K HVOLTGAW 100HMGV6SP- LAB				
Item Note: HMLED3PK450KHVOLTGAW 100HMGV6SP-LAB ABSET-1.50 RFD259416								
HMLED3, 85,000 lumens, 5000K, Autosensing 347-480V, Greay Super Durable, Area wide. 100ft galvanized steel pole with 6-fixture fixed spoke ring, set of 1.50" anchor bolts, sized for 90mph AASHTO 2009 FCIII								
200	11 EA HOLOPHANE			HMLED3PK450K HVOLTGAW 100HMGV8SP				
Item Note: HMLED3PK450KHVOLTGAW 100HMGV8SP-LAB ABSET-1.50 RFD25941								
HMLED3, 85000 lumens, 5000K, Autosensing 347-480V, Greay Super Durable, Area wide. 100ft galvanized steel pole with 8-fixture fixed spoke ring, set of 1.5" anchor bolts, sizedd for 90mph AASHTO 2009 FCIII								
300	99 EA AMR ELEC LGHT			ATB2 60BLEDE10 480 R4 5K				
Item Note: Autobahn LED Roadway - Large ATB2, 60B Chips, 1050mA Driver, 480V, Roadway Type IV, 5000K								
400	38 EA LITHONIA LTG			SSS3966G P2 ND GR				
Item Note: Square Straight Steel Pole 39FT, 6.0 Square x y Gauge Wall: SSS3966G 6.0 Square, Tenon, 2.3.D. X 4inch LG, No Drill Pattern, Gray Paint, Anchor Bolts								

This equipment and associated installation charges may be financed for a low monthly payment through Graybar Financial Services (subject to credit approval). For more information call 1-800-241-7408 to speak with a leasing specialist.

To learn more about Graybar, visit our website at www.graybar.com

24-Hour Emergency Phone#: 1-800-GRAYBAR

Subject to the standard terms and conditions set forth in this document. Unless otherwise noted, freight terms are F.O.B. shipping point prepaid and bill.
Unless noted the estimated ship date will be determined at the time of order placement.

To: TACOMA PORT OF
802 PORT CENTER ROAD
TACOMA WA 98421
Attn: Sharon Rothwell

Date: 04/04/2018
Proj Name: Parcel 77
GB Project Qte#:

Proposal

We Appreciate Your Request and Take Pleasure in Responding As Follows

500 **22 EA UTILITY MTLs SB-390-24-2G**
Item Note: **24" - 3 Arm @ 90 Degrees Spoke Bracket Finish: Hot Dip Galvanize**

600 **1 EA UTILITY MTLs SB-312-24-2G**
Item Note: **24" - 3 Arm @ 120 Degrees Spoke Bracket Finish: Hot Dip**

700 **5 EA UTILITY MTLs SB-218-24-2G**
Item Note: **24" - 2 Arm Spoke Bracket Finish: Hot Dip Galvanize**

800 **10 EA UTILITY MTLs SB-290-24-2G**
Item Note: **24" - 2 Arm @ 90 Degrees Spoke Bracket Finish: Hot Dip Galvanized**

This equipment and associated installation charges may be financed for a low monthly payment through Graybar Financial Services (subject to credit approval). For more information call 1-800-241-7408 to speak with a leasing specialist.

To learn more about Graybar, visit our website at www.graybar.com

24-Hour Emergency Phone#: 1-800-GRAYBAR

Subject to the standard terms and conditions set forth in this document. Unless otherwise noted, freight terms are F.O.B. shipping point prepaid and bill.
Unless noted the estimated ship date will be determined at the time of order placement.

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Examination, preparation, and general installation procedures.
- B. Cutting and patching.

1.02 SUBMITTALS

- A. See Section 01 33 00 - Submittal Procedures
- B. 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.
 - 4. Visual qualities of sight exposed elements.
 - 5. Work of the Port or separate Contractor.
- C. Project As-Built Documents: Accurately record actual locations of capped and active utilities.

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.

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. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- F. 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 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.

3.04 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. In existing work, minimize damage and restore to original condition.
- 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. 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.
 - 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.

3.05 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. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

3.06 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Field engineering services by Contractor.
- B. Land surveying services by Contractor.

1.02 DESCRIPTION OF SERVICES

- A. Specific services listed in this section are in addition to, and do not supersede, general Execution and Closeout Requirements.
- B. Sole responsibility for establishing all locations, dimensions and levels of items of work.
- C. Sole responsibility for provision of all materials required to establish and maintain benchmarks and control points, including batter boards, grade stakes, structure elevation stakes, and other items.
- D. Having a skilled instrument person(s) available on short notice when necessary for laying out the work.
- E. Keeping a transit, theodolite, or TST (total station theodolite with electronic distance measurement device); leveling instrument; and related implements such as survey rods and other measurement devices, at the project site at all times.
- F. Provision of facilities and assistance necessary for Consultant to check lines and grade points placed by Contractor.
- G. Preparation and maintenance of professional-quality, accurate, well organized, legible notes of all measurements and calculations made while surveying and laying out the work.

1.03 REFERENCE STANDARDS

- A. FGDC-STD-007.1 - Geospatial Positioning Accuracy Standards - Part 1: Reporting Methodology; 1998.
- B. FGDC-STD-007.2 - Geospatial Positioning Accuracy Standards - Part 2: Standards for Geodetic Networks; 1998.
- C. State Plane Coordinate System for Washington.

1.04 SUBMITTALS

- A. Informational Submittals: Submit the following:
 - 1. Field Engineering: Submit daily reports, with content as indicated in this section.
 - a. When requested by Consultant, submit for Record documentation verifying accuracy of field engineering including, but not limited to, Contractor's survey notes and field notes.

1.05 QUALITY ASSURANCE

- A. Use adequate number of skilled and thoroughly-trained workers to perform the work of this section in a timely and comprehensive manner.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify layout information shown on the Drawings, in relation to the property survey and existing benchmarks. Notify Port's Representative and Consultant of any discrepancies immediately in writing before proceeding to lay out the work. Locate and protect existing benchmarks and base line. Preserve permanent reference points during construction.
- B. Existing Utilities and Equipment: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify existing conditions.

3.02 FIELD ENGINEERING

- A. Maintain field office files, drawings, specifications, and record documents.
- B. Coordinate field engineering services with Contractor's subcontractors, installers, and suppliers as appropriate.
- C. Prepare layout and coordination drawings for construction operations.
- D. Check and coordinate the work for conflicts and interferences, and immediately advise Consultant and Port of all discrepancies of which Contractor is aware.
- E. Cooperate as required with Consultant and Port in observing the work and performing field inspections.
- F. Review and coordinate work on a regular basis with shop drawings and Contractor's other submittals.
- G. In general unless otherwise specified, match existing adjacent grades.
- H. Check the location, line and grade of every major element as the work progresses. Notify the Consultant when deviations from required lines or grades exceed allowable tolerances. Include in such notifications a thorough explanation of the problem, and a proposed plan and schedule for remedying the deviation. Do not proceed with remedial work without Port's concurrence of the remediation plan.

3.03 LAND SURVEYING

- A. General: Follow standards for geospatial positioning accuracy.
 - 1. FGDC-STD-007.1 as amended by Authority Having Jurisdiction.
 - 2. FGDC-STD-007.2 as amended by Authority Having Jurisdiction.
 - 3. FGDC-STD-007.4 as amended by Authority Having Jurisdiction.
- B. Coordinate survey data with the State Plane Coordinate System of Washington.
- C. Contractor is responsible for the restoration of all property corners and control monuments damaged or destroyed by construction-related activities. Any disturbed monuments must be replaced at Contractor's expense by a surveyor licensed in Washington, and approved by the Consultant.
 - 1. Temporarily suspend work at such points and for such reasonable times as the Port may require for resetting monuments. The Contractor will not be entitled to any additional compensation or extension of time.

3.04 RECORDS

- A. Maintain at the Site a complete and accurate log of control and survey work as it progresses.
1. Organize and record survey data in accordance with recognized professional surveying standards, Laws and Regulations, and prevailing standards of practice in Washington. Record Contractor's surveyor's original field notes, computations, and other surveying data in Contractor-furnished hard-bound field books. Contractor is solely responsible for completeness and accuracy of survey work, and completeness and accuracy of survey records, including field books. Survey records,(including field books) may be rejected by Port due to failure to organize and maintain survey records in a manner that allows reasonable and independent verification of calculations, and/or allows identification of elevations, dimensions, and grades of the work.
 2. Illegible notes or data, and erasures on any page of field books, are unacceptable. Do not submit copied notes or data. Corrections by ruling or lining out errors will be unacceptable unless initialed by the surveyor. Violation of these requirements may require re-surveying the data questioned by Consultant.

END OF SECTION

PART 1 - GENERAL

1.01 RELATED WORK DESCRIBED ELSEWHERE

- A. The provisions and intent of the Contract, including the General Conditions, Supplementary Conditions, and other sections of the General Requirements apply to this work as if specified in this section. Work related to this section is described throughout the specifications.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.01 PROGRESS CLEAN-UP

- A. The Contractor shall clean the project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with all requirements for removal of combustible waste materials and debris.
 - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
 - 3. Containerize unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials for the type of material to be stored.
 - 4. Coordinate progress cleaning for joint use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free from waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.

- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.02 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site, yard, and grounds. in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
 - f. Leave Project clean and ready for occupancy.

3.03 REPAIR OF WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surface, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
 - 1. Touch up and otherwise repair and restore marred or exposed finishes and surface. Replace finishes and surfaces that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

2. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

- A. This section includes construction waste management requirements.

1.02 DEFINITIONS

- A. Co-mingled or Off-site Separation: Collecting all material types into a single bin or mixed collection system and separating the waste materials into recyclable material types at an off-site facility.
- B. Construction, Demolition and Land-Clearing (CDL) Waste: Includes all nonhazardous solid wastes resulting from construction, remodeling, alterations, repair, demolition, and land clearing. Includes material that is recycled, reused, salvaged or disposed as garbage. This also includes uncontaminated soils that are designated as geotechnically unsuitable or excess excavation.
- C. Hazardous/Dangerous Waste: As defined by Chapter 70.105.010 Revised Code of Washington and 40 Code of Federal Register 261 and by Washington Administrative Code 173-303.
- D. Proper Disposal: As defined by the jurisdiction receiving the waste.
- E. Recyclable Materials: Products and materials that can be recovered and remanufactured into new products.
- F. Recycling: The process of sorting, cleaning, treating and reconstituting materials for the purpose of using the material in the manufacture of a new product. Can be conducted on-site (as in the grinding of concrete).
- G. Recycling Facility: An operation that is permitted to accept materials for the purpose of processing the materials into an altered form for the manufacture of a new product.
- H. Salvage for Reuse: Existing usable product or material that can be saved and reused in some manner on the project site or other projects off-site.
- I. Salvage for Resale: Existing usable product or material that can be saved and removed intact (as is) from the project site to another site for resale to others without remanufacturing.
- J. Source-Separated Materials: Materials that are sorted at the site into separate containers for the purpose of reuse or recycling.
- K. Sources Separation: Sorting the recovered materials into specific material types with no, or a minimum amount of, contamination on site.
- L. Time-Based Separation: Collecting waste during each phase of construction or deconstruction that results in primarily one major type of recovered material. The material is removed before it becomes mixed with the material from the next phase of construction.
- M. Garbage: Product or material typically considered to be trash or debris that is unable to be salvaged for resale, salvaged and reused, returned, or recycled.

1.03 SUBMITTALS

1.04 PERFORMANCE GOALS

- A. General: Divert CDL waste to the maximum extent practicable from the landfill by one or a combination of the following activities:
 - 1. Salvage

2. Reuse
 3. Source separated CDL recycling
 4. Co-mingled CDL recycling
- B. CDL waste materials that can be salvaged, resold, reused or recycled, include, but are not limited to the following:
1. Clean dimensional wood, pallet wood, plywood, OSB, and particleboard
 2. Asphalt
 3. Concrete and concrete masonry units
 4. Ferrous and non-ferrous metals
 5. Field office waste paper, aluminum cans, glass, plastic, and cardboard
- C. Hazardous/Dangerous Wastes, contaminated soils and other hazardous materials such as paints, solvents, adhesives, batteries, and fluorescent light bulbs and ballasts shall be disposed of at applicable permitted facilities.

1.05 QUALITY ASSURANCE

- A. Regulatory Requirements: The Contractor shall maintain compliance with all applicable Federal, State, or Local laws that apply to Construction Waste Management and material salvage, reuse, recycling and disposal.
- B. Disposal Sites, Recyclers and Waste Materials Processors: All facilities utilized for management of any materials covered under this specification must maintain all necessary permits as required by federal, state and local jurisdictions.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 SOURCE-SEPARATED CDL RECYCLING

- A. Provide individual containers for separate types of CDL waste to be recycled, clearly labeled with a list of acceptable and unacceptable materials.

3.02 CO-MINGLED CDL RECYCLING

- A. Provide containers for co-mingled CDL waste to be recycled, clearly labeled with a list of acceptable and unacceptable materials.

3.03 LANDFILL

- A. Provide containers for CDL waste that is to be disposed of in a landfill clearly labeled as such.

3.04 REMOVAL OF CDL WASTE FROM PROJECT SITE

- A. Transport CDL waste off Port's property and legally dispose of them.

END OF SECTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures
 - 2. Final completion procedures
 - 3. Warranties
 - 4. As-Built Drawings

1.03 ACTION SUBMITTALS

- A. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

1.04 PROJECT SUBMITTALS

- A. Submittal of Project Warranties
- B. Record Drawings
 - 1. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous recordkeeping requirements and submittals in connection with various construction activities.
- C. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.05 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list) indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Port unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 2. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 3. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by the Contract Document or Engineer. Label with manufacturer's name and model number where applicable.
 - 4. Submit test/adjust/balance records.

5. Submit changeover information related to Port's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 1. Make final changeover of permanent locks and deliver keys to Port
 2. Complete startup and testing of systems and equipment
 3. Perform preventive maintenance on equipment used prior to Substantial Completion
 4. Instruct Port's personnel in operation, adjustment, and maintenance of products, equipment, and systems
 5. Advise Port of changeover in heat and other utilities
 6. Terminate and remove temporary facilities from Project site
 7. Complete final cleaning requirements
- D. Submit a written request for inspection to determine Substantial Completion a minimum of 5 days prior to days prior to date the work will be completed and ready for substantial inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Notice of Substantial Completion after inspection or will notify Contractor of items, either on the Contractor's list or additional items identified by the Engineer, that must be completed or corrected before notice will be issued.
 1. Reinspecting: Request reinspecting when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for final completion.

1.06 PUNCH LIST (LIST OF INCOMPLETE ITEMS)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of Construction.
 1. Organize list of spaces in sequential order.
 2. Organize items applying to each space by major elements.

1.07 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete and submit the following:
 1. Submittal of all remaining items, including as-built documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, surveys, and similar final record information and all other submittals defined in the Contract Documents.
 2. List of Incomplete Items: Submit copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (Punch List). Copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 5 days prior to date the work will be complete and ready for final inspection and tests. On receipt of request, the Engineer will either proceed with inspection or notify contractor of unfulfilled requirements.

1. Reinspecting: Request reinspecting when the Work identified in previous inspections as incomplete is completed or corrected.

1.08 FINAL ACCEPTANCE PROCEDURES

A. Submittals Prior to Final Acceptance:

1. Receipt and approval of application for final payment; due within seven (7) days of receipt of Final Completion by the Engineer.
2. Execution of all Change Orders.
3. Contractor's signed waiver and release of claims on the Engineer provided form.
4. Contractor's submittal of list of all suppliers and subcontractors and the total amounts paid to each on the Engineer provided form;
5. Contractor's submittal of a list of all subcontractors and suppliers requiring Affidavits of Wages paid on the Contract and certify that each of companies will submit an approved Affidavit of Wages paid to the Port within 30 days.

B. The Engineer will issue the Final Acceptance Memo upon receipt of the required submittals.

PART 2 - PRODUCTS

2.01 CONTRACTOR'S WARRANTY

A. The Contractor warrants the labor, materials and equipment delivered under the contract to be free from defects in design, material, or workmanship, and against damage caused prior to final inspection. Unless otherwise specified, this warranty extends for a period of one (1) year from the date of Substantial Completion.

1. Time of Submittal: Submit written warranties on request of Engineer for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit the Port's rights under warranty.
2. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Port or Port tenants during construction.
3. Submit Warranties to the Engineer as a submittal, as described in 01 33 00 – Submittal Procedures.
4. Provide additional copies of each warranty in Operation and Maintenance Manuals as described in 01 78 23 – Operation and Maintenance Manuals.

B. In the event of equipment failure, during such time or in such a location that immediate repairs are mandatory, the Contractor shall respond promptly (within 48 hours), irrespective of day of the week. If the Contractor is not available, the Port will affect repairs. The Contractor shall then reimburse the Port for parts and labor necessary to correct deficiencies as defined within the warranty clause and time.

2.02 AS-BUILT DRAWINGS

- A. Project As-Built Drawings: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
- B. Project As-Built Drawings shall be compiled by the Contractor and submitted to the Engineer for translation to the Record Drawings on a monthly basis.
 - 1. The Project As-Built Drawings will be submitted on paper full-sized (ANSI D) copy.
 - 2. Drawings shall be kept current and shall be done at the time the material and equipment is installed. Annotations to the record documents shall be made with an erasable colored pencil conforming to the following color code:
 - a. Additions – Red
 - b. Deletions – Green
 - c. Comments – Blue
 - d. Dimensions – Graphite
 - 3. Project As-Built Drawings must be complete and accepted by the Engineer before Final Completion is issued.
 - 4. As-Built Drawings shall be in accordance with horizontal and vertical control as shown on the drawings.

PART 3 – EXECUTION

3.01 MAINTENANCE OF AS-BUILT DRAWINGS

- A. The Contractor shall maintain at the Project site, in good order for ready reference by the Engineer, one complete copy of the Contract Documents, including Addenda, Change Orders, other documents issued by the Port, a current Progress Schedule, and approved Submittals. The Contractor shall also generate and keep on site all documents and reports required by applicable permits.
- B. The Contractor's As-Built Drawings shall be updated to record all changes made during construction. The location of all existing or new underground piping, valves and utilities, and obstructions located during the Work shall be appropriately marked until the Contractor incorporates the actual field dimensions and coordinates into the as-built drawings. The as-built drawings shall be updated at least weekly and before elements of the Work are covered or hidden from view. After the completion of the Work, the as-built drawings shall be provided to the Port.

END OF SECTION

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Operation and Maintenance Manual Submittal

1.02 SUBMITTALS

- A. Operation and Maintenance Data:
 - 1. For equipment, or component parts of equipment put into service during construction and operated by the Port, submit completed documents within ten days after acceptance.
 - 2. Submit 1 copy of completed documents 5 days prior to substantial inspection. This copy will be reviewed and returned after substantial inspection, with Engineer comments. Revise content of all document sets as required prior to final submission.
 - 3. Submit 2 sets of revised final documents in final form by Final Completion.

PART 2 - PRODUCTS

2.01 OPERATION AND MAINTENANCE MANUALS

- A. For large equipment (such as pumps, generators, machinery), the following information (minimum of 3 printed copies, plus one electronic copy on CD) shall be furnished for all items on the Project requiring operational and/or maintenance procedures and for any additional items indicated by the Engineer. Printed information shall be organized by the Contractor into appropriately sized 3-ring binders (no larger than 3"). The binders shall be sized for material approximately 8-1/2 by 11 inches, and the material in the binders shall not protrude beyond the covers. The binder(s) shall be divided with coversheets for each major item of equipment. The cover sheets shall be typewritten to indicate the name, type of equipment, and location(s) within the Project where installed. A neatly typewritten index shall be provided. Electronic information shall be in PDF format (additional formats where specified) and shall be organized with folders with appropriate file names so information is easily accessible:
 - 1. Equipment Maintenance Summary:
 - a. Provide the following information (as applicable, indicate 'N/A' where an item does not apply) in Excel spreadsheet format:
 - 1) Asset Number (to be provided by the Engineer at a later date)
 - 2) Description
 - 3) Plan Sheet Number
 - 4) Parcel Number
 - 5) Vendor
 - 6) Manufacturer
 - 7) Model Year
 - 8) Serial Number
 - 9) Warranty – Start Date; Finish Date
 - 10) Required Preventative Maintenance
 - 11) Purchase Price
 - 12) Make

- 13) Model
 - 14) Fuel Used
 - 15) Capacity
2. Lubrication Information: This shall consist of the manufacturer's recommendations regarding the lubricants to be used and the lubrication schedule to be followed. Lubricants shall be described in detail, including type, recommended manufacturer, and manufacturer's specific compound to be used.
 3. Control Diagrams: Diagrams shall show internal and connection wiring and as-built wiring diagrams (where applicable).
 4. Start-up Procedures: These instructions consist of equipment manufacturer's recommendations for installation, adjustment, calibration, and troubleshooting.
 5. Operating Procedures: These instructions consist of the equipment manufacturer's recommended step-by-step procedures for starting, operating, stopping the equipment under specified modes of operation, and for long-term shut-down (moth-balling).
 6. Preventative Maintenance Procedures: These instructions consist of the equipment manufacturer's recommended steps and schedules for maintaining the equipment.
 7. Overhaul Instructions: These instructions consist of the manufacturer's directions for the disassembly, repair and reassembly of the equipment and any safety precautions that must be observed while performing the work.
 8. Parts List: This list consists of the generic title and identification number of each component part of the equipment. This list shall include weights of individual components of each item of equipment weighing over 100 pounds.
 9. Spare Parts List: This list consists of the manufacturer's recommendations of number of parts which should be stored by the Owner and any special storage precautions which may be required.
 10. Exploded View: Exploded or cut views of equipment shall be provided if available as a standard item of the manufacturer's information. When exploded or cut views are not available, plan and section views shall be provided with detailed callouts.
 11. Specific Information: Where items of information not included in the above list are required, they will be provided as described in the specifications for the equipment.
 12. Complete identification, including model and serial numbers.
 13. Submittal information, as specified in Section 01 33 00 Submittal Procedures.
 14. Warranty Information: This information consists of the name, address, and telephone number of the manufacturer's representative to be contacted for warranty, parts, or service information.
 15. Provide DVDs, and audio-visual training materials utilized in the manufacturer's instruction program for the Owner.
 16. All operation and maintenance information shall be comprehensive and detailed and shall contain information adequately covering all normal operation and maintenance procedures.
 17. All information shall be specific for the items of equipment installed on the project. Material not directly applicable shall be removed, omitted, or clearly marked as inapplicable.

18. If manufacturer's standard brochures and manuals are used to describe operating and maintenance procedures, such brochures and manuals shall be modified to reflect only the model or series of equipment used on this project.
 19. Extraneous material shall be crossed out neatly or otherwise annotated or eliminated. It shall be the responsibility of the Contractor to ensure that all operation and maintenance materials are obtained. Material submitted must meet the approval of the Engineer prior to project final acceptance.
- B. For small equipment and products (such as furnishings or equipment not requiring routine maintenance), the following information (minimum of 3 printed copies, plus one electronic copy on CD) shall be furnished for all items on the Project requiring operational and/or maintenance procedures and for any additional items indicated by the Engineer. Printed information shall be organized by the Contractor into appropriately sized 3-ring binders (no larger than 3"). The binders shall be sized for material approximately 8-1/2 by 11 inches, and the material in the binders shall not protrude beyond the covers. The binder(s) shall be divided with coversheets for each major item of equipment. The cover sheets shall be typewritten to indicate the name, type of equipment, and location(s) within the Project where installed. A neatly typewritten index shall be provided. Electronic information shall be in PDF format (additional formats where specified) and shall be organized with folders and appropriate file names so as to make the information easily accessible:
1. Product Summary:
 - a. Provide the following information (as applicable, indicate 'N/A' where an item does not apply) in Excel spreadsheet format:
 - 1) Asset Number (to be provided by the Engineer at a later date)
 - 2) Description
 - 3) Plan Sheet Number
 - 4) Parcel Number
 - 5) Vendor
 - 6) Manufacturer
 - 7) Model Year
 - 8) Serial Number
 - 9) Warranty – Start Date; Finish Date
 - 10) Purchase Price
 - 11) Make
 - 12) Model
 2. Operating Procedures: These instructions consist of the manufacturer's recommended step-by-step procedures for use of the product.
 3. Maintenance Procedures: These instructions consist of the equipment manufacturer's recommended steps and schedules for maintaining the product.
 4. Specific Information: Where items of information not included in the above list are required, they will be provided as described in the specifications for the equipment.

5. Complete identification, including model and serial numbers.
6. Submittal information, as specified in Section 01 33 00 Submittal Procedures.
7. Warranty Information: This information consists of the name, address, and telephone number of the manufacturer's representative to be contacted for warranty, parts, or service information.
8. Provide DVDs, and audio-visual training materials utilized in the manufacturer's instruction program for the Owner.
9. All operation and maintenance information shall be comprehensive and detailed and shall contain information adequately covering all normal operation and maintenance procedures.
10. All information shall be specific for the items of equipment installed on the project. Material not directly applicable shall be removed, omitted, or clearly marked as inapplicable.
11. If manufacturer's standard brochures and manuals are used to describe operating and maintenance procedures, such brochures and manuals shall be modified to reflect only the model or series of equipment used on this project.
12. Extraneous material shall be crossed out neatly or otherwise annotated or eliminated. It shall be the responsibility of the Contractor to ensure that all operation and maintenance materials are obtained. Material submitted must meet the approval of the Engineer prior to project final acceptance.

PART 3 - EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. The extent and location of the demolition work is indicated on the Drawings and in the specifications. The work includes, but is not limited to:
 - 1. The requirements for the removal, wholly or in part, and satisfactory disposal of buildings, pavements, retaining walls, fencing, storm drainage and utility pipelines and structures, miscellaneous site debris, and other obstructions which are designated to be demolished on the Drawings or within these Specifications.
 - 2. Payment of all costs required for disposal of items at legal disposal sites, including all permit fees and related costs.
 - 3. Salvaging items as indicated on the Drawings and in the specifications.
 - 4. Backfilling and compaction of holes, voids, trenches or pits that result from such removal.
- B. All demolition items not identified for salvage by the Engineer shall become the property of the Contractor. Disposal of all demolition items shall be in accordance with the specifications, local, state and federal requirements.

1.02 SUBMITTALS

- A. Demolition Management Plan (DMP)
 - 1. The DMP shall provide the procedures proposed for the complete accomplishment of the demolition work and management of the demolition wastes and documentation. The procedures shall provide for safe conduct of the work, careful removal and disposition of materials specified to be salvaged or disposed, protection of property to remain undisturbed, and coordination with other work in progress. The procedures shall include a detailed description of the methods, staff, and equipment to be used for each operation, the sequence of operations, and quality control measures to ensure compliance with the Contract and regulatory requirements.
 - 2. Submittal requirements in Section 01 35 43.19, Export Soil Management and 01 74 19 Construction Waste Management and Disposal may be included as part of DMP plan or submitted separately.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 PREPARATION

- A. Utility locates shall be performed prior to start of demolition. Coordinate and resolve with the Engineer to turn off or de-energize affected services before starting demolition.
- B. Verify all items for demolition, disposal, and salvage as early as practicable prior to start of the work. Notify the Engineer immediately if observed conditions differ from anticipated conditions.

C. Pothole investigations:

1. Perform pothole investigations to determine the alignment and horizontal and vertical position of utilities at the locations indicated on the Drawings.
2. Potholes shall be 12-inch diameter air vacuum excavations.
3. Survey utilities located by potholing and provide survey data to the Engineer within 5 days of completing pothole investigations.
4. Backfill pothole excavations with Gravel Backfill for Pipe Zone Bedding.

3.02 DISPOSAL AND DISPOSITION OF MATERIALS

A. Disposition of Materials

1. All materials and equipment removed, and not used for relay or reinstallation within the project, shall become the property of the Contractor and shall be removed from Port property.
2. The Contractor assumes full responsibility for the proper disposal of all demolition materials under this Contract in a manner that meets the requirements of federal, state and local regulations for protecting the health and safety of employees, the public, and for protecting the environment.
3. Existing ballast, excavated base course and excavated soil to be disposed of off site in accordance with Section 01 35 43.19 Export Soil Management.

B. Cleanup:

1. Haul route and paved site areas will be swept to remove any construction debris or soil tracked out by construction equipment and vehicles.
2. There shall be no debris, rubble or litter left at the site from any of the demolition operations and the site shall be clean.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

The Work includes furnishing of all necessary material, labor, and equipment for providing the support and forms for all concrete work. Also included in this section are the requirements for removal of the forms and their support.

1.02 QUALITY ASSURANCE

- A. Concrete forms shall be designed by the Contractor to meet the requirements of the type of concrete, sequence of placing schedule, control of dimensions of the hardened concrete, and other conditions of the project.
- B. Concrete Forms: Clean concrete forms of all material or other objects considered deleterious to the concrete structure or surface.
- C. The reference standards for formwork are ACI 347 and ACI 301.

1.03 SUBMITTALS

Prior to commencement of other work in this section, the Contractor shall submit the following items to the Engineer in accordance with Section 01 33 00 "Submittal Procedures."

- A. Formwork and shoring design calculations and shop drawings shall be submitted to the Engineer for review prior to erecting formwork. Design calculations and shop Drawings shall bear the seal and signature of the responsible licensed Engineers. Submitted documents not bearing the seal and signature will be rejected without review.

PART 2 - PRODUCTS

2.01 GENERAL

Materials for concrete forms may be new or used. The quality of the materials, not the age or previous usage, will be the determining factor as to their suitability.

2.02 JOB-BUILT FORMS

- A. WOOD FORMS
- B. Framing lumber shall be of standard dimensions and of such quality as to meet the requirements of the stresses applied.
 - 1. Use Plyform Plywood for all exposed concrete forms.
 - 2. Shiplap, square-edged boards, or tongue-and-groove sheathing may be used for forming unexposed concrete surfaces.
 - 3. Use metal, fiberglass, or other special form lining where indicated on the Drawings.

C. STEEL FORMS

1. Steel forms to be fabricated at the site shall be approved by the Engineer prior to construction.
2. Forms for round columns or shafts shall consist of self-supporting metal shell or tube which will give a smooth, even surface. Forms which produced a spiral appearance or those made of wood shall not be used except as approved by the Engineer.

D. MISCELLANEOUS FORMS

Paper, fiberglass, micarta, asphalt-impregnated fiber, and other miscellaneous form materials shall be approved by the Engineer prior to construction.

2.03 PREFABRICATED FORMS

All prefabricated forms, whether they are part of a patented system or custom-fabricated, shall be approved by the Engineer prior to assembly.

2.04 FORM LINERS AND COATINGS

Line, coat, or treat forms with a suitable bond-breaker to ensure their timely removal with minimum damage to the concrete. Bond-breaker material shall be noncoloring and shall not leave a film on the concrete surface that will prohibit the subsequent finishing activities required to attain the desired appearance.

2.05 FORM TIES AND ACCESSORIES

- A. Form ties shall be manufactured items with premeasured, break-back, weakened areas so that ties can be removed within (3/4)-inch of the concrete surface.
- B. Tie rods for use with she-bolts shall be set back (1-1/2 inches) from the concrete surface.
- C. Wire ties and wood spacers shall not be used.
- D. Corner brackets, friction collars, column clamps, and other specialized accessories shall be utilized in accordance with the manufacturer's recommendations.

PART 3 - EXECUTION

3.01 GENERAL

Forms shall be cleaned before assembly of all material that would be considered harmful to the concrete structure/surface.

3.02 FORM INSTALLATION

- A. Forms shall be built to the exact size and shape of the concrete member or part shown or specified. Forms shall be constructed as to be unyielding, true to line and level, and sufficiently tight to prevent escape of mortar, and shall be properly and

effectively braced to prevent collapse or deformation of the member being cast. Openings in concrete shall be placed at the location shown on the Drawings. All openings shall be formed and fastened securely in position to maintain the specified concrete cover of all reinforcement and to leave a smooth and true opening after the forms are removed.

- B. Prior to final setting or placing reinforcing steel, forms shall be treated with a bond breaker or parting compound. The compound shall be applied at a rate recommended by the manufacturer which will provide a smooth surface free of dusting action caused by the chemical reaction of the compound.
- C. Forms may be set with a slight bevel or draft for easy removal, where approved by the Engineer. Corners shall be chamfered 3/4-inch.
- D. All forms shall be mortar-tight. Standing water in the forms will not be permitted. Immediately prior to placing concrete, the forms shall be cleaned and wetted.

3.03 REMOVAL OF FALSEWORK AND FORMS

- A. Forms shall remain in place a minimum length of time as follows, during which the temperature averages 40° F or higher:

Type I-II
Cement

Type III Cement
High-Early-Strength Concrete

7-days

72-hours

Where lower temperatures prevail, forms shall remain in place longer, at the Port's discretion. All periods during which the ambient air temperature is below 40°F shall be disregarded in estimating the total time required prior to form removal during which artificial heat is not applied.

- B. In lieu of the above methods for determining the time at form removal, forms may be removed when concrete cylinder tests indicate a compressive strength equal to 80 percent of the specified 28-day strength for the concrete. Additional concrete cylinder testing beyond the Port protocol and for the purpose of ascertaining the 80 percent threshold shall be at the Contractor's expense.
- C. The removal of forms, as herein stipulated, shall in no case relieve the Contractor of responsibility for the final acceptability or appearance of the work.
- D. All form removal shall be accomplished in a manner which will prevent injury to the concrete.
- E. Removal of formwork shall be considered incidental to the Work performed and no separate payment will be allowed for this work.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

The Work includes the requirements for furnishing, detailing, cutting, bending, transporting, and placing of all concrete reinforcement and associated items required or indicated on the Drawings.

1.02 QUALITY ASSURANCE:

A. Qualifications of Workmen:

Provide at least one (1) person who shall be present at all times during execution of this portion of the Work and who shall be thoroughly familiar with the type of materials being installed and the best methods for their installation and who shall direct all work performed under this section.

B. Reference Standards:

1. ACI 318, Building Code Requirements for Reinforced Concrete
2. ACI 315, Manual of Standard Practice for Detailing Reinforced Concrete Structures
3. ACI 301, Specifications for Structural Concrete for Buildings
4. Washington State Department of Transportation (WSDOT) Standard Specifications, 2018 Edition
5. American Welding Society (AWS) D1.4 Structural Welding Code – Reinforcing Steel
6. Concrete Steel Reinforcing Institute (CRSI), Manual of Standard Practice, 27th Edition.
7. WABO Standard No. 27-13, "WABO Welder and Welding Operator Performance Qualification Standard for Structural Steel, Sheet Steel, and Reinforcing Steel".

1.03 SUBMITTALS:

Before materials are delivered to the job site, submit the following items to the Engineer in accordance with Section 01 33 00 "Submittal Procedures."

- A. Submit complete shop drawings for the Engineer's review, prior to fabrication.
- B. Submit mill certificates for each heat of steel, indicating Specification compliance regarding strength and chemistry of steel to be furnished.

1.04 PRODUCT HANDLING:

A. Protection:

1. Protect reinforcement before, during, and after installation and protect the installed work and materials of other trades.
2. Store in a manner to prevent fouling with dirt, grease, and other bond-breaking coatings.

3. Use all necessary precautions to maintain identification after the bundles are broken.

B. Replacements:

In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer at no additional cost to the Port.

PART 2 - PRODUCTS

2.01 REINFORCEMENT:

- A. All reinforcement material shall be new and free from rust.
- B. All reinforcing bars, except as noted below shall be deformed billet steel bars, conforming to ASTM A 615, Grade 60.
- C. Spiral reinforcing bars shall be undeformed plain bars or wire conforming to ASTM A 615, Grade 60, ASTM A 706, or ASTM A 82 as indicated on the Drawings.
- D. Mechanical splices for reinforcing bars shall be Lenton Standard Couplers or approved equivalent. Couplers shall develop 125 percent of the minimum yield strength of reinforcing bar.
- E. Mechanical anchors for reinforcing bars shall be Lenton Terminator or approved equivalent. Anchor shall develop the yield strength of the reinforcement without damaging the concrete.

2.02 OTHER MATERIALS:

All other materials not specifically described but required for a complete and proper installation of reinforcement, shall be as selected by the Contractor, subject to the approval of the Engineer.

PART 3 - EXECUTION

3.01 GENERAL:

- A. Prior to installation of this section, carefully inspect the installed work of other trades and verify that such work is complete to the point where this installation may properly commence.
- B. Details of bending, placing, and splicing of all reinforcing steel shall conform to ACI 318, except as modified herein.

3.02 REINFORCING STEEL BARS:

- A. Order Lists: Before ordering material, furnish all order lists and bending diagrams for approval by the Engineer; reinforcement placing Drawings submitted for approval shall conform to CRSI detailing practice. Do not order material until such lists and bending diagrams have been approved.

The approval of order lists and bending diagrams by the Engineer shall in no way relieve the Contractor of responsibility for the correctness of such lists and diagrams.

B. Fabrication:

Bend all bars cold to the shapes indicated on the Drawings unless otherwise approved by the Engineer. Do not field-bend bars partially embedded in concrete except as indicated on the Drawings or as approved by the Engineer. Make bends and hooks in accordance with the applicable portions of the Concrete Reinforcing Steel Institute.

C. Placing and Fastening:

1. Place all steel reinforcement accurately and hold firmly in the position indicated on the Drawings during the placing and setting of concrete. Tie bars at all intersections.
2. Minimum concrete cover shall be in accordance with ACI 315 and ACI 318 unless otherwise noted on the Drawings.
3. Distance from the forms shall be maintained by means of stays, blocks, ties, hangers, or other approved supports. Blocks for holding reinforcement from contact with the forms shall be precast mortar blocks of not less than 3750 psi compressive strength, of approved shape and dimensions, or approved metal chairs. Metal chairs which are in contact with the exterior surface of the concrete shall be plastic coated. Layers of bars shall be separated by spacer bars, plastic-coated chairs, precast mortar blocks of not less than 3750 psi compressive strength or other equally suitable devices.
4. In the event that conduits, piping, inserts, sleeves, or other items interfere with placing reinforcement as indicated on the Drawings or as otherwise required, immediately consult the Engineer and obtain approval of new procedure before placing concrete.

3.03 SPLICING:

- A. All reinforcement, except as noted below, shall be furnished in the full lengths as indicated on the Drawings. Splicing of bars, except when indicated on the Drawings, will not be permitted without written approval of the Engineer.

3.04 CLEANING REINFORCEMENT:

- A. Steel reinforcement, at the time concrete is placed around it, shall be free from loose rust or mill scale, oil, paint, and all other coatings which will destroy or reduce bond between steel and concrete.

3.05 INSPECTION:

- A. Reinforcement in any member shall be placed and then inspected by the Engineer before the placing of concrete may begin. Concrete placed in violation of this provision may be rejected, and the Contractor will be required to remove the rejected concrete at no additional cost to the Port.
- B. The Contractor shall notify the Engineer at least 24 hours in advance of any concrete pour, to allow for proper inspection.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

The extent and location of the cast-in-place concrete work are indicated on the Drawings. The work includes furnishing of all labor, material, and equipment for providing cast-in-place concrete and associated work, all as indicated in the Drawings, notes, and this Specification.

1.02 GENERAL

All concrete work shall conform to the requirements of ACI 301 unless otherwise noted in the Drawings and/or this Specification.

1.03 QUALITY ASSURANCE

A. Inspection and Testing

The Port will provide for necessary inspection and testing as required. The Contractor shall provide all necessary assistance in carrying out such inspections and tests, including sufficient mixed concrete and constituent materials required for testing and inspection, at no additional cost to the Port.

B. Qualification of Workmen

1. Provide at least one person who shall be present at all times during execution of this portion of the work, who shall be thoroughly trained and experienced in concrete work, and who shall direct all work performed under this section.
2. Trained and experienced journeyman concrete finishers shall be responsible for finishing of exposed surfaces.

C. Reference Standards

1. ACI 318, Building Code Requirements for Reinforced Concrete
2. ACI 301, Specification for Structural Concrete for Buildings
3. ACI 302, Concrete Floor and Slab Construction
4. ACI 305, Hot Weather Concreting
5. ACI 306, Cold Weather Concreting
6. ACI 308, Standard Practice for Curing Concrete
7. ACI 315, Manual of Standard Practice for Detailing Reinforced Concrete Structures.
8. International Building Code (IBC), 2003, as amended and adopted by the City of Tacoma.

1.04 SUBMITTALS

All cast-in-place concrete shall be proportioned on the basis of field experience or laboratory trial mixtures.

The following documents shall be submitted to and approved by the Engineer, in accordance with Section 01 33 00 "Submittal Procedures," before any concrete can be placed on the job:

- A. Certificates of Specification compliance for materials to be used.
- B. Proposed concrete design mix, indicating constituent material contents per cubic yard of concrete.
- C. Test certificates for compressive strength, yield, air content, and slump of the proposed concrete mix. As a minimum, compressive strength test results at 7, 14, and 28-days shall be provided in accordance with ACI 318 5.3.
- D. Manufacturer's name and Specifications and certificates of compliance with applicable standards shall be provided for all admixtures, concrete bonding agents, curing compounds, etc., proposed for use on the job.
- E. Manufacturer's data for pre-fabricated construction joint systems and hardware.

PART 2 - PRODUCTS

2.01 GENERAL

All concrete, unless specifically permitted by the Engineer, shall be ready-mix. Batching, mixing, transportation, and delivery of ready-mix concrete shall conform to ASTM C 94.

2.02 MATERIALS

- A. Portland cement for use in mixes without fly ash shall be Type I-II or Type II conforming to ASTM C 150 and ASTM C 595. Upon written authorization of the Port, Type III cement may be used for mixes without fly ash.

The C3A content of the cement shall be no less than 4% nor more than 10%. Portland cement for use in mixes with fly ash shall be Type I or Type I-II conforming to ASTM C 150. If fly ash is used, it shall meet the requirements of ASTM C 618, Type F, with the added provisions that the loss on ignition shall not exceed 1 percent, and that the fly ash is stored in a separate silo from that of cement. Split bins are not acceptable.

- B. All coarse and fine aggregate shall consist of hard, tough, durable, particles free from foreign materials, and shall be stored in such a manner as to prevent segregation, excessive breakage, and the introduction of foreign material. Aggregate shall conform to ASTM C 33 and additionally shall have a minimum of two fractured face. The maximum size of coarse aggregate shall not be larger than three fourths of the minimum clear spacing between reinforcing steel bars and/or between bars and side forms and/or between bars and top or bottom surface of the concrete. Lightweight aggregate or aggregate larger than 1-1/2 inch shall not be used without written permission from the Port. The maximum size of coarse aggregate for "pea gravel" concrete shall be 3/8-inch.
- C. Water-reducing admixtures shall be used and conform to the requirements of ASTM C 494. Dosage rates shall be in accordance with the manufacturer's recommendations.

- D. Air-entraining admixtures shall conform to ASTM C 260. Dosage rates shall be in accordance with the manufacturer's recommendations to meet the air content specified herein. The air-entraining admixture shall be added directly to the concrete materials either before or during mixing.

2.03 OTHER MATERIALS

All other materials, not specifically described but required for a complete and proper installation of cast-in-place concrete, shall be as selected and provided by the Contractor subject to the approval of the Port.

2.04 MIX PROPORTIONS AND STRENGTH

- A. The proportions of aggregate to cement for any concrete shall be such as to produce a mixture which will work readily into the corners and angles of the forms, around reinforcement and embedded items, with the least possible segregation of the material and preventing excess free water to collect on the surface.
- B. The mix proportions shall be selected in accordance with ACI 318. Deviation from any reviewed design mix without written authorization of the Engineer will not be permitted.
- C. All concrete, except as otherwise noted in the Drawings, shall develop a minimum compressive strength of 4000 psi in 28-days and shall meet the following requirements:

1. Minimum Cementitious Material

Concrete without fly ash	611 lbs./cy
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Concrete with fly ash	517 lbs./cy and 100 lb fly ash/cy
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2. Maximum Water/Cement Ratio (by weight, including free moisture on aggregate)

0.40*

* If fly ash is used, the water/cement ratio shall be calculated as the weight of water divided by the weight of cement plus the weight of the fly ash.

3. Air Content

5% \pm 1 1/2%

4. Water-reducer admixture shall be Type A, D, F, or G. The amount shall be such to control the desired workability and water/cement ratio of the mix.

5. Slump: 3 to 5-inches with Type A or D admixtures, 4 to 8-inches with Type F or G admixtures. The slump shall be chosen to enhance workability without violating the specified maximum water/cement ratio.

PART 3 - EXECUTION

3.01 PREPARATORY WORK

A. Inspection

1. Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
2. Verify that all items to be embedded in concrete are in place, properly oriented, located, and secured.
3. Verify that concrete may be placed to the lines and elevations indicated on the Drawings, with all required clearance for reinforcement.

B. General

1. All areas in which concrete is to be placed shall be thoroughly cleaned to remove all wood debris, sawdust, tie wire cuttings, and all deleterious materials. Existing concrete or concrete from a previous pour shall be cleaned and roughened to provide a bondable surface. Concrete forms which have not been treated with oils, waxes, or other bond breakers shall be thoroughly wet prior to placing concrete.
2. All transporting and handling equipment shall be cleaned of all hardened concrete.

C. Notification

Notify the Engineer at least 24-hours in advance of concrete placement.

3.02 TRANSPORTING AND PLACING CONCRETE

- A. Concrete shall be placed as soon as possible after mixing and shall be plastic and readily workable when placed in the forms. Partially set concrete shall not be retempered for use.
- B. The method and manner of placing concrete shall avoid segregation of the aggregate, or displacement of reinforcement.
- C. Conveyor belts, when used, shall be limited to approximately 300-feet in length to prevent segregation and shall be covered to protect the concrete from sun or rain.
- D. Aluminum conduits or tremies shall not be used for pumping or placing concrete.
- E. Concrete shall be placed in continuous horizontal layers not exceeding 18-inches, and so compacted that there will be no line of separation between layers. Care shall be taken to fill each part of the form by depositing concrete directly to or as near the final position as possible.
- F. When concrete must be dropped more than 5-feet into the forms, it shall be deposited through an approved conduit (tremie). The tremie conduit shall also be used to place concrete in sloping forms or in other locations, as directed, to prevent concrete from segregation caused by sliding around reinforcing or other embedments.
- G. In general, the method of depositing and compacting concrete shall be conducted so as to form a compact, dense, impervious concrete with the required surface finish

without rock-pockets, and a minimum of segregation. Defective concrete shall be removed at the Contractor's expense.

- H. Concrete shall not be placed where other work in the area, such as driving piling or sheets, or other vibratory action will adversely affect the initial set or strength of the concrete. To the maximum extent possible, cast-in-place concrete shall not be placed within 100-feet of concrete or sheet pile driving.
- I. Mechanical vibrators shall not be used for transporting concrete.
- J. Water shall not be added to concrete on-site without approval of the Engineer.
- K. Contractor shall ensure that washout of concrete trucks is performed with all applicable codes and regulations. Contractor may establish a contained truck washout area using washout pans or perform washout at an existing offsite washout and disposal facility. Washout area shall be sealed to prevent discharge of concrete, slurry or residuals to waters of the State. Wash out concrete truck chutes, pumps, and internals into formed areas only. Do not wash out concrete trucks onto the ground, or into storm drains, open ditches, streets, or streams. Return unused concrete remaining in the truck and pump to the originating batch plant for recycling. Do not dump excess concrete on site, except in designated concrete washout areas. At the completion of work the Contractor shall remove all washout debris from the site and restore the washout area to preconstruction condition.

3.03 CONSTRUCTION JOINTS

Joints and stoppages, except as specifically shown on the Drawings, shall generally conform to ACI 318. Joints shall be located so as not to significantly impair the strength of the structure and only as approved by the Port. Thoroughly clean all joints to remove all loose concrete and laitance. Roughen joint surface to a 1/4" amplitude. Unless otherwise noted, wet and coat all cleaned joints with neat cement bond grout immediately before placing fresh concrete.

Pre-fabricated construction jointing systems and products shall be submitted for review and approval by the Port prior to use.

3.04 COLD/HOT WEATHER CONCRETING

Do not place concrete when the atmospheric temperature drops below 40°F or rises above 90°F, unless special procedures are followed. Procedures for production, delivery, placing, curing, inspection, and testing of concrete under hot or cold weather conditions shall follow the recommendations of ACI 305, "Hot Weather Concreting" or ACI 306, "Cold Weather Concreting".

If concrete is placed during cold or hot weather conditions, the Contractor shall submit documentation to the Port demonstrating how the procedures described in the above referenced ACI documents will be followed. The Contractor's documentation shall be received by the Port no later than 72 hours prior to concrete placement. The Port's review of this documentation does not relieve the Contractor's responsibility to provide concrete per the Contract Documents.

3.05 CONSOLIDATING CONCRETE

- A. The Contractor shall provide suitable internal vibrators for use in compacting all concrete. The vibrators shall be of the type designed to be placed directly in the concrete and their frequency of vibration shall be not less than 7000 impulses per minute when in actual operation.
- B. Vibration shall be such that the concrete becomes uniformly plastic. Vibrators shall be inserted to a depth sufficient to vibrate the bottom of each layer effectively, but shall not be allowed to penetrate partially hardened concrete. The vibrators shall not be applied directly to steel which extends into partially hardened concrete. The intervals between points of insertion shall not be less than 2-feet nor more than 3-feet.
- C. Vibration shall not continue in any one spot to the extent that pools of grout are formed. In vibrating and finishing top surfaces which are exposed to weather or wear, extreme care shall be exercised to avoid drawing water or laitance to the surface. In relatively high lifts, the top layer shall be comparatively shallow and the concrete mix shall be as stiff as can be effectively vibrated into place and properly finished. Vibrators shall not be used to transport or move concrete inside the form.
- D. The Contractor shall supply a sufficient number of vibrators to effectively vibrate all of the concrete placed. Hand tamping shall be required wherever necessary to secure a smooth and dense concrete on the outside surfaces.

3.06 CURING CONCRETE

- A. Refer to ACI 308 for recommended practices for curing concrete.
- B. Concrete (other than high-early strength) shall be maintained above 50°F and in a moist condition for at least the first seven days after placement.
- C. High-early strength concrete shall be maintained above 50°F and in a moist condition for at least the first three days after placement.
- D. All concrete shall be protected from mechanical injury and accelerated drying. No fire or excessive heat shall be permitted near the concrete at any time.
- E. Accelerated curing methods, if used, must be approved by the Engineer.

3.07 FINISHING CONCRETE

- A. General:

All permanently exposed surfaces, unless specifically noted otherwise, shall be free from local bulging and all unsightly ridges or lips shall be removed to leave a smooth, flat surface. Excessive rubbing will not be permitted. Patching mortar, if used, shall be of the same color as the surrounding concrete. White Portland cement shall be added to patching mortar for color matching purposes.

- B. Walls and Vertical Surfaces:

Immediately after removal of form or absorptive form lining, concrete surfaces shall be inspected for defects. All defects, voids, defective concrete, and tie rod holes shall be repaired immediately after the forms are removed unless

otherwise directed by the Port. All exposed tie wire shall be removed (chipped out) and patched. The concrete used for repairing shall be of such quality that it can be thoroughly bonded to the adjacent concrete.

All defects shall be repaired no later than 48-hours after form removal.

C. Horizontal Surfaces:

1. All horizontal surfaces that will carry additional concrete shall be thoroughly roughened to an amplitude of 1/4-inch and cleaned of all laitance and unsatisfactory concrete.
2. Other horizontal surfaces that will not receive any additional concrete shall have a smooth wood float finish except for the top of the bullrail which shall have a broom finish. The broom strip shall be approximately 1/16-inch.

D. Protection of Finish:

Every precaution shall be taken by the Contractor to protect finished surfaces from stains or abrasions. Surfaces or edges likely to be injured during the construction period shall be properly protected.

3.08 TESTING

- A. Testing of concrete material will be done by the Engineer. Methods of sampling, testing, evaluation, and acceptance will conform to ACI 301. All fresh concrete samples intended for testing will be taken at the point of deposit into the formwork.
- B. Testing, as described above, will be at Port's discretion and in no way relieves the Contractor of any obligations.
- C. Tests will be performed at no cost to the Contractor, except as noted. The following services shall be performed, when necessary, at Contractor's cost:
 1. Additional testing and inspection required because of changes in materials, proportions, and procedures requested by the Contractor.
 2. Additional testing of materials or concrete occasioned by their failure by test or inspection to meet Specification requirements.
- D. Any delivered load of concrete that is rejected shall be completely disposed of off-site. Any truck rejected shall not be permitted to return to the project site for the duration of the workday.

END OF SECTION

DIVISION 26 – ELECTRICAL
Section 26 05 00 – General Electrical Provisions

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The Electrical work consists of furnishing, installing, testing and placing in satisfactory operation all equipment, materials, devices and appurtenances, necessary to provide complete systems according to the intent of the Drawings and Specifications. In general, this includes all labor, materials, electrical equipment, tools, and other incidental equipment to complete the work.
- B. Provide all ductbanks, vaults, metering equipment, and pads for Tacoma Power's medium voltage system, that provides all four (4) electrical services to the site, as shown on the drawings
- C. Provide all ductbanks, vaults, and wires for power and lighting systems as shown on the drawings.
- D. Provide all ductbanks, and vaults for the communications and CCTV/Security system as shown on the drawings.
- E. Provide additional equipment and materials to provide complete and functional systems as shown on the drawings.
- F. Coordinate with other trades to provide complete and functional systems as shown on the drawings.
- G. Provide design/build wireless lighting control system.
- H. Port of Tacoma Furnished Equipment. The Port will furnish the following equipment to the Contractor:
 - 1. Light poles
 - 2. Luminaires

1.02 INTENT OF DRAWINGS

- A. The drawings are intended to serve as working drawings for general layout. Equipment, receptacles, switches, panels, lights, disconnects and raceways are partially diagrammatic and do not necessarily indicate actual routings or all appurtenances required for a complete installation.
- B. Minor changes in the locations of raceways, devices and the like, from those shown on the plans, shall be made without extra charge if so directed by the Port of Tacoma/ Engineer before installation.

DIVISION 26 – ELECTRICAL
Section 26 05 00 – General Electrical Provisions

1.03 MANUFACTURERS' RECOMMENDATIONS

- A. Make all installations in strict accordance with manufacturers' published recommendations and details. All equipment and materials recommended by them shall be considered as part of this contract.

1.04 WORK RELATED TO OTHER DIVISIONS

A. TEMPORARY CONSTRUCTION POWER & LIGHTING

1. Arrange with Tacoma Power, Joe Rempe (253)-502-8290) for 120/240 Volt or 208Y/120 Volt service adjacent to construction site.
2. Contractor is responsible for all costs associated with setup and removal of the temporary construction service meter. Contractor shall pay Tacoma Power for all temporary electricity bills during construction. Include this fee in the bid proposal.
3. Provide, maintain and remove, when no longer required, temporary electrical construction wiring from the construction service meter to job shack services and receptacles required. Wiring to construction sheds, outdoor construction machinery, and temporary exterior work areas shall be the responsibility of individual contractors.
4. Provide and maintain construction lighting with portable wiring and temporary energization of the permanent building wiring, complete with lamps. Suitable construction lighting shall be provided for any of the contractors on the job. See NEC ARTICLE 305. Temporary wiring.
5. Contractor is responsible for re-lamping construction lighting after the initial lamping.
6. Provide adequate feeders, circuit breakers and duplex 15-ampere 120-volt receptacles at locations as required. Note: 120 Volt construction receptacles shall provide Ground Fault circuit protection in accordance with applicable WISHA safety standards.
7. Portable power cords from the outlets specified herein shall be the responsibility of individual contractors using the cords.
8. Responsibilities outlined in the Paragraph Temporary Construction Power and Lighting are delineated herein to avoid conflicts between the various contractors. Contractor shall assume all responsibility for safety, Electrical and Safety Code compliance, performance and

DIVISION 26 – ELECTRICAL

Section 26 05 00 – General Electrical Provisions

adequacy of the construction power and lighting installation. The Port assumes no responsibility for the performance or safety and will not inspect nor design this temporary installation as it is not part of the completed structure.

C. EQUIPMENT FURNISHED BY OTHERS

1. All electrical equipment furnished for this project shall be coordinated with the drawings to insure correctness of Voltage, Phase and Ampacity. Equipment served by single circuit or feeder shall be provided with appropriate internal wiring including fusing of multiple circuits as required by code.
2. Contractors and subcontractors supplying equipment that is incompatible with the designed electrical service shall be responsible for arranging and providing necessary changes in their supply wiring to suit the equipment.
3. Verify dimensions of equipment to be furnished by others to insure correct clearances and connections.
4. Control Voltages shall not exceed 120 Volts. Provide control transformers for higher line voltages. Control transformers shall be connected from phase to neutral.

1.05 SUPERVISION AND COORDINATION

- A. Coordinate work with Tacoma Power to ensure compliance with their specific requirements. Before starting work, contact Tacoma Power to schedule and coordinate all four (4) electrical services for this project. Contact Joe Rempé of Tacoma Power at (253)-502-8290).
- B. Contact Electrical Inspection and obtain permit before starting work.
- C. Maintain adequate supervision of the Division 26 work and have a responsible person in charge at the site any time work is in progress or when necessary for coordination with other trades.
- D. Schedule work to best serve the interests of the Owner. Lay out work by referring to Civil and other Contractors to anticipate their movements. Cooperate with the other contractors on the job and coordinate work to avoid interference with them.
- E. Determine a satisfactory space allocation arrangement where electrical material is installed in proximity to work of other trades. No extra payments

DIVISION 26 – ELECTRICAL

Section 26 05 00 – General Electrical Provisions

will be allowed to relocate work that interferes with that of other trades.

1.06 CODES AND REGULATIONS

- A. All work shall conform to current applicable National, State and local Codes; these shall be regarded as the minimum standard of quality for material and workmanship. Contractor shall provide all Labor and Material that may be required for compliance with Code Requirements or Code Interpretations, although not specifically detailed on the Drawings or in the Specifications. Contractor shall become familiar with all the following codes prior to bidding.

ASTM American Society for Testing and Materials

NBFU National Board of Fire Underwriters

NEC National Electrical Code

--- State Electrical Code

NESC National Electrical Safety Code

NEMA National Electric Manufacturers Association

NFPA National Fire Protection Association

UL Underwriters Laboratories, Inc.

ICEA Insulated Cable Engineers Associations

CBM Certified Ballast Manufacturers

--- Federal, State and Local Building Codes

ETL Electrical Testing Laboratories

--- Local Electrical Code

--- Service Policies of the Serving Electrical Utility

- B. Nothing in these Drawings and Specifications shall be construed as permitting work not conforming with governing codes.
- D. The Contractor shall not be relieved from complying with any requirements of these contract documents which may exceed, but not conflict with, requirements of the governing codes.
- E. Contractor should include in the bid all costs to have a Department of Labor & Industries approved firm evaluate the installation safety, and compliance with code as required per 296-40-100 for any equipment specified or furnished that is not UL labeled.

1.07 PERMITS & FEES

- A. Obtain and pay all fees for licenses, permits and inspections required by laws, ordinances and rules governing work specified herein. Arrange for inspection of work and provide inspectors with all necessary assistance.

1.08 WORKMANSHIP

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- A. All work shall be done by competent craftsmen skilled in the specific work to be done. Equipment shall be installed in a neat and workmanlike manner following the best practice of the trade.

1.09 OPERATING INSTRUCTIONS

- A. Fully instruct the Owner's designated representatives in the operation and maintenance of all components of the electrical system upon completion of the work and after all tests and final inspection(s) by the Authority(s) Having Jurisdiction.

- B. Provide scheduled instruction as follows:

- 1. Lighting Control & Distribution System ½ hour

All costs for contractor's instruction are to be included in the bid proposal.

- C. Instructors shall be contractor's superintendents or foreman knowledgeable in each system and equipment suppliers representatives for special systems.

1.10 AS-BUILT RECORD DRAWINGS

- A. Continuously maintain a set of As-Built Drawings to indicate all significant deviations from the original design and the actual placement of equipment and underground conduits. Location of conduit stub-outs shall be dimensioned from accepted reference lines.

Changes shall be shown with red colored pencil while work is in progress. This "As-Built" set shall be clearly marked: "AS-BUILT RECORD DRAWINGS - Do Not Remove From Office."

- B. Refer to Section 01 70 00 for final As-Built Drawings requirements.

1.11 ELECTRICAL EQUIPMENT OPERATION AND MAINTENANCE (O&M) MANUALS

- A. Prepare four (4) copies of O & M manuals that contain operating and maintenance information, replacement parts list, shop drawings, wiring diagrams and equipment test data for all equipment and systems installed under this contract. Manuals shall be organized as follows:

- 1. All information contained in the manuals shall be grouped by specification section categories. Manual shall be provided with a typewritten index identifying divider tabs to facilitate future references.
 - 2. Maintenance Information shall pertain to the exact equipment installed, not to the complete "line" of a manufacturer. Actual installed

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equipment shall be neatly and clearly identified on catalog sheets that show other equipment as well. All equipment in the O & M manuals shall be identified in exactly the same manner as used in the contract documents.

3. Parts list shall give original manufacturers ordering information. Parts information that has been relabeled or renumbered by the equipment supplier will not be acceptable. The following information shall be provided as a minimum for each item:
 - a. Manufacturer's name, address and phone number.
 - b. Local supplier's name, address and phone number.
 - c. Complete parts lists including quantities and manufacturers part numbers.
 - d. Installation instructions.
 - e. Maintenance recommendations including maintenance procedure and recommended maintenance intervals listed in hours of operation, calendar units or similar time units.
4. Shop drawings and wiring diagrams shall be complete for the specific system installed under the contract. "Typical" drawings and diagrams will not be acceptable unless properly marked to indicate the exact field installation. Equipment control diagrams shall be accompanied by written descriptions to familiarize maintenance personnel with proper equipment operation. Diagnostic "trouble-shooting" information shall be included where applicable.
5. Provide electrical equipment test data, as applicable, for all motors according to Section 26 05 02 - "Testing." Tabulation shall be in columnar format; equipment designations shall correspond to those used on actual identification nameplates.
6. Each O & M manual shall be assembled in a loose leaf, 3 ring hard cover binder.
 - a. The covers shall have a typewritten adhesive label with the name of the Project, Owner, Electrical Engineer, Division 26 Contractor and year of completion. The back edge shall have a typewritten adhesive label with the name of the Project, Owner and year of completion.
7. Submit a preliminary copy, complete except for the bound cover, for

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review and comments 20 days prior to completion of the project.

1.12 FINAL INSPECTION

- A. The electrical foreman or superintendent shall accompany the Engineer on the Final Inspection, and on any necessary Post-Final Inspections, to confirm that all work has been satisfactorily completed.
- B. Defects and deficiencies found during this Final Inspection shall be corrected within 15 days of Contractor's receipt of Engineer's final punch list.

1.13 CLOSEOUT REQUIREMENTS

- A. These items are a prerequisite for final payment:
 - 1. Electrical Equipment Operation and Maintenance Manuals which will also include the items listed below.
 - 2. Certificates of Final Inspection
 - a) Electrical Inspector
 - 3. Guarantee to Owner
 - 4. As-Built record drawings per section 01 70 00.

1.14 GUARANTEE

- A. The Division 26 Contractor shall provide written guarantee to repair or replace (without additional expense) any defective materials or workmanship which become evident within a period of one (1) year after final acceptance or for such longer period as elsewhere specified. All warranty work shall be to the satisfaction of the Owner.
- B. Any material guaranteed by a specific manufacturer for a period in excess of one year shall be specifically noted on the Owner's written guarantee.

END OF SECTION

DIVISION 26 – ELECTRICAL
Section 26 05 01 – Basic Materials & Methods

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. General requirements for materials and installation methods.

PART 2 - PRODUCTS

2.01 GENERAL

- A. All materials shall be new, free from defects, of the quality specified herein and on the drawings. Materials shall be designed to insure satisfactory operation and rated life in the prevailing environmental conditions where they are being installed. They shall be listed by Underwriter's Laboratories or a recognized testing laboratory for use under these conditions.
- B. Each type of material shall be of the same make and quality throughout the job. The materials furnished shall be the latest standard design products of manufacturers regularly engaged in their production.

2.02 TECHNICAL DATA

- A. Technical information contained herein relies entirely on tests and ratings provided by manufacturers who are solely responsible for their accuracy. The Engineer, by use of this information in no way implies the results of published manufacturer's information has been verified.

2.03 AS SPECIFIED EQUIPMENT

- A. This specification generally lists only one make and model number for each item of equipment or material required for the project. This is not intended to be restrictive but is intended to indicate the standard of quality, design and features required. In addition, the listed product is the basis of the design regarding physical size, electrical power requirements and performance. The product so identified is designated "as specified or approved equal."

2.04 SUBSTITUTION OF MATERIALS

- A. Listing of approved materials is not intended to prevent acceptance of other materials provided the substitute products are submitted for approval and have been approved in accordance with the Substitution of Materials requirements.

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2.05 COMPLETE SYSTEMS

- A. All systems specified herein and shown on the drawings shall be complete and operational in every detail. Mention of certain materials in bidding documents shall not be construed as releasing the Contractor from furnishing such additional materials and performing all labor required to provide a complete and operable system.

2.06 SUBMITTALS

- A. Purpose of Submittals
 - 1. Submittals processed by the Engineer are not change orders. The Contractor, by the submittal process, demonstrates an understanding of the design concept by indicating equipment and materials intended to be provided and fabrication/installation methods intended to be utilized to meet all requirements of the contract documents.
 - 2. The Engineer's review is for general conformance with the design concept and the contract documents. Markings or comments shall not be construed as relieving the Contractor from compliance with the contract documents.

2.07 ELECTRICAL EQUIPMENT IDENTIFICATION

- A. General: These items shall be provided with nameplates:
 - 1. Disconnect switches, panelboards, lighting control panels, circuit breakers, contactors, and relays in separate enclosures.
 - 2. Special systems shall be properly identified at outlets, junction and pull boxes, terminal cabinets and equipment racks.
- B. Nameplate Inscription
 - 1. All nameplates shall adequately describe the function or operation of the identified equipment as required.
 - 2. Panelboard nameplates shall include equipment designation, voltage and phase of supply, i.e., Panel A, 208/120V, 3 phase, 4 wire.

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3. Nameplate designations shall be consistent for all components of a particular piece of equipment, such as starter, disconnect switch, Push Button control station(s) and the like.
 4. Contractor shall submit a complete list of nameplates for approval.
- C. Nameplate Construction
1. Nameplates shall be laminated phenolic plastic with minimum 3/16" high black engraved characters on white background.
 2. Nameplates shall be securely fastened to the equipment with No. 4 round-head philips, cadmium plated steel, self-tapping screws. Contact cement adhesive only is not acceptable.

PART 3 - EXECUTION

3.01 PROTECTION OF WORK

- A. Protect all work, wire, cable, materials and equipment installed under this division against damage by other trades, weather conditions or any other causes.

Equipment found damaged or in other than new condition will be rejected as defective.

- B. Transformers, panels, light fixtures and electrical equipment shall be kept covered or enclosed to exclude moisture, dust, dirt, cement, or paint and shall be free of all such contamination before acceptance. Enclosures and trims shall be in new condition, free of rust, scratches or other finish defects. Properly refinish in a manner acceptable to the Engineer if damaged.
- C. Keep conduit and raceways closed with suitable plugs or caps during construction to prevent entrance of dirt, moisture, concrete or foreign objects. Raceways shall be clean and dry before installation of wire and at the time of acceptance.
- D. Make up and insulate wiring promptly after installation of conductors. Wire shall not be pulled-in until raceways are complete, all bushings are installed, and raceway terminations are completed. Wire shall not be pulled into conduit embedded in concrete until after the concrete is placed and forms are removed.

3.02 EXCAVATIONS

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Section 26 05 01 – Basic Materials & Methods

- A. The contractor shall be fully responsible for the location and protection of all existing utilities.

The contractor shall verify all utility locations prior to construction by calling the underground locate line at 1-800-424-5555, minimum of 48 hours prior to any excavation. The contractor will also be responsible for maintaining all locate marks once the utilities have been located.

- B. See Section 31 00 00 regarding backfill requirements and excess material handling.

3.03 CLEAN UP

- A. Contractor shall continually remove debris, cuttings, crates, cartons, etc., created by his work. Such clean up shall be done at sufficient frequency to minimum hazard to the public, other workmen, and the Owner's employees.

Before acceptance of the installation, Contractor shall carefully clean cabinets, panels, wiring devices, cover plates, etc., to remove dirt, cuttings, concrete, etc. Blemishes to finished surfaces or apparatus shall be removed and new finish equal to the original applies.

3.04 LABELING

- A. Clearly and properly label the complete electrical system, as specified herein, to indicate the loads served or the function of each item of equipment connected under this contract.
- B. Control circuits shall utilize combinations of colors with each conductor identified throughout using wrap around numbers or letters. Identification shall be consistent with the contract drawing requirements and operation and maintenance shop drawings.

END OF SECTION

DIVISION 26 – ELECTRICAL
Section 26 05 02 – Testing

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Perform tests of the electrical system to assure code compliance and proper system operation according to the intent of the contract documents. Retain the services of approved testing agency(s) to comply with the requirements of this section.
- B. Applicable Codes, Standards & References for Tests:
All inspections and tests shall be in accordance with the following applicable codes and standards except as provided otherwise herein.
 - 1. National Electrical Code - NEC
 - 2. National Electrical Manufacturer's Association - NEMA
 - 3. American Society for Testing and Materials - ASTM
 - 4. Institute of Electrical and Electronic Engineers - IEEE
 - 5. National Electrical Testing Association - NETA
 - 6. American National Standards Institute - ANSI
 - 7. State and Local Codes and Ordinances
 - 8. Insulated Cable Engineers Associate - ICEA
 - 9. Association of Edison Illuminating Companies - AEIC

1.02 CIRCUIT TESTS

- A. The Contractor shall perform routine insulation resistance, continuity and grounding tests for all distribution and utilization equipment prior to their connection and energization. A standard megger-type instrument shall be used to demonstrate that insulation values are acceptable, ground system is continuous and the neutral system is isolated from the grounding system except at the systems' single ground point.
- B. System defects, indicated by the circuit tests, shall be corrected. Tests shall be repeated until satisfactory results are obtained.

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Section 26 05 02 – Testing

1.03 GROUNDING TEST

- A. Measure the ohmic value of the Electrical Service Entrance "System Ground" with reference to "Earth Ground" using multiple terminal, fall of potential methods and suitable test instruments.
- B. Maximum resistance to ground shall be less than 10 ohms unless lower values are specified in the contract documents. Notify the Engineer if this resistance value is not obtained for the initially installed system; and then provide corrective measures as required to reduce ground resistance to less than 10 ohms.

1.04 PHASE BALANCE TESTS

- A. Verify the balance of the electrical system's phase currents. Reassign load connections if necessary to obtain a balance that is acceptable to the Engineer.

PART 2 - PRODUCTS

2.01 MATERIALS AND INSTRUMENTATION

- A. Contractor and/or testing agency shall supply all apparatus and materials required for indicated tests.
- B. Contractor shall include all costs associated with testing in bid proposal.

PART 3 - EXECUTION

3.01 TESTING PROCEDURE

- A. All tests shall be conducted according to applicable industry standards.

3.02 SCHEDULING

- A. Notify Engineer at least five (5) working days prior to performance of any test.

END OF SECTION

DIVISION 26 – ELECTRICAL
Section 26 05 17 – Mini Power Zones

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Provide mini power zones of the types and characteristics specified herein and as shown on the drawings.

PART 2 – PRODUCTS

2.01 PRODUCT DESCRIPTION

- A. Mini power zones shall be as manufactured by Square D or approved equal. They shall consist of main breaker (transformer primary protection), cast coil transformer, and panelboard with main breaker (transformer secondary protection). Mini power zones shall be in a NEMA 4X stainless steel enclosure.

PART 3 EXECUTION – PRODUCTS

3.01 MOUNTING

- A. General
 - 1. Transformers shall be mounted as shown on the plans or as required for the particular installation.
 - 2. All units shall be seismically restrained/braced to comply with the requirements of the Uniform Building Code (UBC).
 - 3. Remove all shipping blocks and packing materials prior to installation.
 - 4. Provide shop drawings for approval of any special mounting brackets or hangers.

3.02 GROUNDING CONNECTIONS

- A. Mini power zone shall be considered “grounded, neutral, separately derived systems.” The neutral shall be grounded per code accordingly.

END OF SECTION

DIVISION 26 – ELECTRICAL

Section 26 05 19 – Wire and Cables, Secondary Voltages

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Provide all wire, cable and terminations for a complete installation.

PART 2 - PRODUCTS

2.01 PACKAGING

- A. Conductors shall be delivered to the job site in approved original cartons, or on reels as recommended by the manufacturer, and shall bear the Underwriter's Laboratory (UL) Label. Reels shall be provided with suitable protection to prevent fork-lift damage to conductors during shipment or storage prior to use.

2.02 SPECIALIZED CONDUCTORS

- A. Conductors for specialized systems shall be as recommended by the equipment manufacturer.

2.03 CONDUCTORS - 600 VOLTS

- A. Copper, insulated for 600 volts.
- B. Insulation type XHHW-2.

2.04 CONNECTORS - 600 Volts

- A. Branch circuit conductor splices:

Pre-insulated "twist-on" type or "crimped-on" type as approved (Scotch-lok, Ideal or equal).
- B. Cable Splices:

Split-bolt or tool applied sleeves with pre-formed insulated cover, heat shrinkable tubing or approved plastic insulating tape.
- C. Terminator lugs of No. 12 wire and smaller:

Spade, insulated type to be tool applied.
- D. Terminator lugs for No. 10 wire or larger:

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Two-bolt (or approved positive restraint), tool applied compression type (Burndy or equal).

2.05 INSULATING MATERIALS

- A. Insulating tape or heat shrink tubing shall have the equivalent rating of the applicable conductor insulation (Scotch 3M, RAYCHEM or equal).

2.06 PLASTIC CABLE TIES

- A. Nylon, or equivalent, locking type (T&B or equal).

PART 3 - EXECUTION

3.01 GENERAL

- A. Install all wiring in raceway.

3.02 MINIMUM WIRE SIZE

Lighting and Power System	No. 12 AWG
Wiring in Lighting Fixtures	No. 12 AWG
Control Circuits for Motors, etc.	No. 14 AWG

3.03 CONDUCTOR TYPES, REFERENCED ON PLAN

- A. Conductors shall be copper.

3.04 CONDUCTOR COLORING CODE

Conductor color coding shall be as follows:

- A. 208/120 volt system
 - A Phase - Black
 - B Phase - Red
 - C Phase - Blue
 - Neutral – White
 - Grounding – Green
 - Switched wires – Other colors
- B. 480/277 volt system
 - A Phase - Brown
 - B Phase - Orange
 - C Phase - Yellow
 - Neutral -Gray

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Section 26 05 19 – Wire and Cables, Secondary Voltages

Grounding – Green with yellow strip
Other Colors - Switched Wires

- C. Conductors shall have colored insulation except wires larger than #8 may be black with colored tape identification at all terminations and splices.
- D. Additional colors may be used where such colors will help in identifying wires and different systems.

3.05 CONDUCTOR INSTALLATION

- A. Raceways shall be complete, clean and free of burrs before pulling conductors.
- B. U.L. approved pulling compounds may be used with the residue cleaned from the conductors and raceway entrances after the pull is made.
- C. Contractor shall obtain the manufacturer's published recommendations for the handling, pulling and terminating of the cable. Contractor shall perform work in accord with manufacturer's recommendations and accept all responsibility for work not in accord with manufacturer's recommendations.
- D. Pulleys or blocks shall be used for alignment of the conductors when pulling. Pulling shall be in accordance with manufacturer's specifications regarding pulling tensions, bending radius of the cable and compounds.
- E. No mechanical pulling means shall be used for wires No. 8 AWG and smaller. Cables shall be pulled by the conductor, not by the insulation or shielding.

3.06 MOISTURE PROTECTION

- A. Cable ends shall be protected at all times from moisture. Provide approved heat-shrink end caps or equivalent for all unterminated cable ends.

3.07 CONDUCTORS IN PANELS

- A. Conductors in panels and terminal cabinets shall be neatly grouped and formed in a manner to "fan" into terminals with regular spacing.

3.08 CABLE SUPPORTS

- A. Provide conductor support devices as required by code in vertical cable runs.

3.09 INSULATION REMOVAL

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Section 26 05 19 – Wire and Cables, Secondary Voltages

- A. Insulation shall be removed with approved wire stripping tools. Conductors that are nicked or ringed are unacceptable and shall be cut off and re-stripped.

3.10 INSULATION OF ENERGIZED TERMINATIONS

- A. Insulate all exposed energized connections and splices with approved tape or heat shrink tubing. Tape, if used, shall be half-lapped in two directions.

3.11 TERMINATIONS - COPPER CONDUCTORS 600 VOLTS

- A. Control and special systems wires shall be terminated with a crimped-on lug when terminating at a screw connection.
- B. All screw and bolt type connectors shall be made up tight and retightened after an eight-hour period. Tighten all bolted connections with a ratcheting type torque wrench per manufacturer's standards.
- B. All tool applied crimped connectors shall be applied per manufacturer's recommendations and physically checked for tightness.

3.12 IDENTIFICATION

- A. Tag and label each conductor at each end with stamped metal tags.

END OF SECTION

DIVISION 26 – ELECTRICAL
Section 26 05 26 – Grounding

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Provide a complete grounding system that complies with the current edition of the National Electrical Code (NEC), and all applicable regulatory codes.

PART 2 - PRODUCTS

2.01 GROUND RODS

- A. Minimum size: 3/4" diameter by 8'-0" long, copper-clad steel rods, or as noted on the drawings.

2.02 GROUND CONDUCTORS

- A. Grounding conductors shall be soft drawn, bare, stranded copper unless otherwise noted. Size as shown on the plans and per the National Electrical Code (NEC) Article 250.
 - 1. GROUNDING ELECTRODE CONDUCTORS FOR A.C. SYSTEMS:
See NEC table 250-94
 - 2. EQUIPMENT GROUNDING CONDUCTORS:
See NEC table 250-95
Equipment grounding conductors may be insulated; provide green insulation and/or approved permanent identification for conductors larger than No. 6 AWG.

2.03 GROUND ELECTRODE CONNECTORS

- A. Connectors for grounding electrode conductor to ground rod shall be of the thermal fusion type; conductor-to-conductor connections may be either thermal fusion or approved hydraulically applied compression type.

2.04 GROUNDING BUSHINGS

- A. Grounding bushings shall be matched to the ampacity of the grounding conductor and shall have approved set-screw type grounding lug connectors.

2.05 GROUNDING CONNECTORS

- A. Shall meet the requirements of ground bushings, cast, set-screw or bolted type.

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Section 26 05 26 – Grounding

2.06 GROUNDING CLAMPS

- A. Clamps shall be matched to the ampacity of the grounding conductor. Provide approved raceway hub where grounding conductor is shown protected by conduit or armored cable. Clamps shall be U-bolt type for connection to waterpipes.

PART 3 - EXECUTION

3.01 GROUND CONTINUITY

- A. Maintain ground continuity throughout the entire electrical system.
- B. Ground per NEC.
- C. Provide approved grounding bushings or locknuts on all conduits terminating in panelboards, pullboxes or other enclosures to insure continuity of conduit grounding connections.
- D. Provide a separate grounding conductor in all conduits.
- E. All plug-in receptacles shall be bonded to the box and ground system.

3.02 GROUNDING CONNECTIONS

- A. All grounding connections shall be carefully made to insure low system impedance. Locate grounding connections to allow future servicing and expansion.

3.03 PREPARATION

- A. Prior to making mechanical or thermal connections, all conductors shall be clean, dry and bright with the bonding surface thoroughly cleaned of any oxides, mill, scale or other foreign matter.

3.04 PROTECTION

- A. Ground conductors shall be protected from damage during construction. Provide protective coverings or rigid non-ferrous conduit.

3.05 GROUND RODS

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Section 26 05 26 – Grounding

- A. Ground rods shall be driven into undisturbed soil to full depth. Provide additional rods, ionic salt solutions and the like where special low-resistant grounds are encountered.

3.06 CONCEALED GROUND ELECTRODE SYSTEM

- A. Concealed ground electrode systems, shall be installed, inspected, tested and certified for low resistance connections and low resistance to earth ground prior to being covered.

3.07 THROUGH-SLAB GROUND PENETRATIONS

- A. Ground conductors extending through the slab shall be protected by a rigid conduit sleeve; the void portion of the sleeve shall be packed with a non-hardening type duct seal.

3.08 TESTING

- A. Shall conform to Section 26 05 02.

END OF SECTION

DIVISION 26 – ELECTRICAL
Section 26 05 33 - Raceways

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Provide all raceways for a complete electrical system. Include all fittings, hangers and appurtenances required for a complete installation.

PART 2 - PRODUCTS

2.01 CONDUITS

- A. Galvanized Rigid Steel, thick wall (GRS)
- B. Flexible Metal Conduit with polyvinyl chloride jacket
- C. Non-metallic, polyvinyl chloride (PVC), schedule 80

2.02 FITTINGS

- A. GRS couplings and connectors shall have threaded connections. Galvanized malleable iron or non-corrosive alloy compatible with galvanized conduit. Running thread or set screw type fittings are not permitted.
- B. Flexible Metal Conduit shall be Thomas & Betts "Super Liquid-Tight" with external ground lug.
- C. PVC fittings shall be solvent welded.

PART 3 - EXECUTION

3.01 GENERAL

- A. Install PVC Schedule 80 raceways concealed below grade. For above grade raceways use galvanized rigid steel.
- B. Cut conduit ends square, ream smooth and extend maximum distance into all couplings and connectors.
- C. Provide and install manufactured end caps on all conduit ends during construction to prevent the entrance of water or dirt. Tape, as a cover, is not acceptable.
- D. Pull a properly sized mandrel through each conduit prior to installation of

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conductors or pull-lines to remove any materials trapped within the conduit run.

- E. All PVC elbows shall be factory made.
- F. Field made elbows are acceptable for steel conduits when made with approved bending tools. Bends that show conduit flattened or deformation are unacceptable and shall be replaced.
- G. Conduits shall maintain a minimum 12" clearance from any high temperature surface.
- H. The conduit layout shall be carefully planned by the contractor to ensure neat and workmanlike installation.
- I. Any work showing inadequate planning may be ordered removed by the Engineer and shall be replaced in a neat and proper manner at no additional cost to the owner.

3.02 CONDUIT SIZING

- A. Conduits shall be sized as shown on the drawings. Minimum conduit size shall be $\frac{3}{4}$ " trade diameter.

3.03 GRS

- A. Install GRS for all conduits in wet locations, concrete, exposed to weather, hazardous locations, where subject to physical damage and as noted on drawings.
- B. Connections shall be watertight in damp locations.

3.04 FLEXIBLE CONDUIT

- A. Provide liquid tight flexible conduit connection to equipment with at least a 60-degree loop to allow for isolation and flexibility. Provide bonding jumper as required by N.E.C.

3.05 PVC CONDUIT SCHEDULE 80

- A. PVC schedule 80 conduit shall be used underground. Field bends, less than 45 degrees, when necessary, shall be formed with factory recommended heater. PVC bends 45 degrees or greater shall be factory made.

3.06 UNDERGROUND RACEWAYS

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Section 26 05 33 - Raceways

- A. Burial depth of underground raceways shall be not less than indicated on drawings and shall be deeper where so noted herein or required to avoid conflicts.

3.07 STUBUPS THROUGH CONCRETE SLABS

- A. Conduits through concrete slabs shall be steel. Install at such depth that the exposed conduit is vertical and curved section of the elbow is not visible.

3.08 PULL-LINES

- A. Provide 150-pound plastic pull-lines in conduit-only systems and spare conduits to facilitate future conductor installation. Tag and label each end with stamped metal tags.

END OF SECTION

DIVISION 26 - ELECTRICAL

Section 26 05 43 - Underground Ducts and Handholes

PART 1 GENERAL

1.01 SUMMARY

- A. This Section includes the requirements for trenching, backfilling and installation of underground conduits, ducts and ductbanks, and the design, fabrication, delivery and installation of pull boxes, and handholes.
- B. Related Documents: The provisions and intent of the Contract, the General and Supplementary Conditions, and Division 1 Specification Sections, apply to the Work as if specified in this Section.

1.02 REFERENCES

- A. ASTM (American Society for Testing and Materials).
- B. NFPA 70 (National Fire Protection Association) - National Electrical Code.

1.03 QUALITY ASSURANCE

- A. Listing and Labeling: Provide products that are Listed and Labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to the Authority Having Jurisdiction and marked for intended use for the location and environment in which they are installed.
- B. Comply with NFPA 70, as adopted and administered by the Authority Having Jurisdiction.
- C. ANSI C2 "National Electrical Safety Code" for components and installation.

1.04 DEFINITIONS

- A. Duct: Electrical conduit and other raceway, either metallic or nonmetallic, used underground, embedded in earth or concrete.
- B. Ductbank: 2 or more conduits or another raceway installed underground in the same trench or concrete envelope.
- C. Handhole: An underground junction box in a duct or duct bank.
- D. Vault: An underground utility structure, large enough for a person to enter, with facilities for installing, operating, and maintaining equipment and wiring.

1.05 COORDINATION

- A. Coordinate layout and installation of ducts, and handholes with final arrangement of other utilities as determined by field verification. Revise locations and elevations from those indicated as required to suit field conditions and ensure that duct runs drain to handholes.

1.06 SAFETY REQUIREMENTS

- A. Perform work in accordance with the safety requirements of the Department of Labor Occupational Safety and Health Administration, Volume 36, Number 75, Part II, Subpart P, "Excavations, Trenching, and Shoring," and

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with Section 7 of the Manual of Accident Prevention in Construction as published by the Association General Contractors of America, Inc.

- B. Educate supervisors and employees on safety requirements and practices to be followed during the course of the work.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver ducts to site with ends capped. Store nonmetallic ducts with supports to prevent bending, warping, and deforming.
- B. Store precast concrete units at site as recommended by manufacturer to prevent physical damage. Arrange so identification markings are visible.
- C. Lift and support precast concrete units only at designated lifting or supporting points.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Manholes, Handholes and Vaults: Subject to compliance with requirements, provide products by one of the following or approved equal:
 - 1. Utility Vault Company
 - 2. PIPE

2.02 CONDUIT AND DUCTS

- A. Metallic Conduit: Galvanized Rigid Steel Conduit (GRC): ANSI C80.1.
- B. Nonmetallic conduit:
 - 1. Rigid Plastic Conduit: NEMA TC 2, UL 651A, Schedule 80 PVC, rated for use with 90°C conductors under all installation conditions and labeled for underground use.

2.03 CONDUIT FITTINGS

- A. Steel Fittings: Zinc-coated, cast malleable, ferrous metal, threaded fittings, with neoprene cover gasket on each fitting installed outdoors.
- B. PVC Conduit and Tubing Fittings: NEMA TC 3.
- C. "Mogul Fittings": Provide "Mogul" size fittings for all conduit.
- D. Seal Bushings: O.Z. compound bushing on each conduit entering a building from outside underground and on each conduit passing from one space into another, which is normally at a lower temperature.
- E. Hubs: Appleton "Hub" or "Hub-U" series or Thomas & Betts "370" series or equal, hub on each conduit terminating in a box where a hub was not previously provided.
- F. Unions: Appleton Type "EC" or Thomas & Betts "Erickson Coupling" conduit unions where necessary.

2.04 DUCT SUPPORTS

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- A. Rigid PVC spacers selected to provide 3" minimum duct spacings.

2.05 HANDHOLES

- A. General: Precast concrete as indicated on Drawings, with the following standard features:
 - 1. Cover with insert or other device to facilitate lifting.
 - 2. Cover with locking devices similar to REA or FARGO.
 - 3. Drain hole in base, 2-inch minimum diameter.
 - 4. Knockouts in sides of adequate number and spacing to accommodate ductbank shown.

2.06 ACCESSORIES

- A. Cable Stanchions: Hot-rolled, hot-dipped galvanized "T" section steel, 2-1/4-inch size, punched with 14 holes on 1-1/2-inch centers for cable arm attachment.
- B. Cable Arms: 3/16-inch thick hot-rolled, hot-dipped galvanized sheet steel pressed to channel shape, arranged for secure mounting in horizontal position at any position on cable stanchions.
- C. Cable Support Insulators: High glaze, wet-process porcelain arranged for mounting on cable arms.
- D. Ground Rods: Solid copper clad steel, 3/4-inch diameter by 8-feet length.
- E. Ground Wire: Stranded bare copper, #2 AWG minimum.
- F. Duct Sealing Compound: Non-hardening, safe for human skin contact, not deleterious to cable insulation, workable at temperatures as low as 35°F withstands temperature of 300°F without slump, and adheres to clean surfaces of plastic ducts, metallic conduits, conduit coatings, concrete, masonry, lead, cable sheaths, cable jackets, insulation materials, and the common metals.

2.07 BACKFILL MATERIAL

- A. See Specification Section 31 00 00 for fill material requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine site to receive ducts and handholes for compliance with installation tolerances and other conditions affecting performance of the underground ducts and handholes. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Existing Utilities: Locate all existing utilities in the area prior to performing any excavation.

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3.02 EARTHWORK

A. Trenching:

1. Comply with OSHA/WISHA safety standards for trenching, including stable slope and shoring requirements.
2. Depth: Refer to Drawings for trench depth requirements. Correct points of over-excavation using mechanically-compacted backfill to form a smooth trench bottom.
3. Width: Excavate to minimum width consistent with stability of sides.
4. Slope: Slope trenches so that conduit and ducts drain toward manholes and handholes and away from buildings and equipment.
5. Muck Excavation: Where muck or unstable material is encountered, over-excavate and backfill to attain proper grade with coarse sand, gravel, or Controlled Density Fill.
6. Pile backfill material in an orderly manner; a sufficient distance from the trench to avoid overloading trench banks.
7. Bedding: The entire bottom of the excavation is to be firm, stable, and at uniform density.

- B. Excavating for Handholes: Provide 12" minimum clearance between outer surfaces of unit and embankment or timber used for shoring.

3.03 RACEWAY APPLICATIONS

- A. Refer to Specifications and Drawings for raceway materials. Where not specified otherwise, use metallic conduit above and underground.
- B. Metallic Conduit: Only use as specified in this section.
- C. Nonmetallic conduit: Use underground only.
1. Underground Direct-Burial: Schedule 80 Rigid Plastic Conduit.
- D. Use PVC Schedule 80 fittings for PVC conduit and suitable water-tight connections where PVC conduit connects to galvanized steel conduit.

3.04 CONDUIT AND DUCT INSTALLATION

- A. Install all conduits as indicated on Drawings and according to manufacturer's written instructions.
- B. Slope: Pitch ducts minimum of 4 inches per 100 feet to drain toward handholes and away from buildings and equipment.
- C. Make joints in ducts and fittings watertight according to manufacturer's instructions. Stagger couplings so those of adjacent ducts do not lie in the same plane.
- D. Stub-Ups: Use rigid steel conduit for stub-ups through concrete to equipment. Install insulated grounding bushings at the conduit terminations. For equipment mounted on outdoor concrete pads, extend steel conduit a

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minimum of 2 feet beyond the edge of the pad. Couple steel conduits to the ducts with adapters designed for the purpose and then encase the coupling with 3 inches of concrete.

- E. Sealing: Provide temporary closure at all duct terminations in handholes installed in this Project. Use sealing compound and plugs to withstand a minimum of 15 psi hydrostatic pressure.
- F. Pulling Cord: Install 100-pound- test nylon cord in installed ducts, including spares.

3.05 BACKFILLING

- A. Backfill only after all necessary inspections and tests have been performed.
- B. Remove all debris, rocks, broken concrete, and formwork before backfilling trenches.
- C. Use Controlled Density Fill under pavement areas or wherever non-settling backfill is required.
- D. Deposit backfill in layers with materials described in Article 2.07, "Backfill Material." Uniformly spread and compact backfill with suitable power tampers to the density of the adjacent soil and in such a manner so as not to disturb the alignment of the conduit. If settlement occurs, refill, compact and smooth off to conform to the surface of the ground.
- E. Restore surface features at areas disturbed by excavation, and reestablish original grades.
 - 1. Replace removed sod as soon as possible after backfilling is completed.
 - 2. Restore all areas disturbed by trenching, storing of dirt, cable laying, and other work.
 - 3. Restore vegetation and provide necessary topsoil, fertilizer, lime, seed, sod, sprigging, or mulching.
 - 4. Replace disturbed paving.

3.06 HANDHOLE INSTALLATION

- A. Install as indicated on Drawings according to manufacturer's written instructions and ASTM C 891.
 - 1. Install units plumb and level and with orientation and depth coordinated with arrangement of connecting ducts to minimize bends and deflections required for proper entrances.
 - 2. Support units on a level bed of crushed stone or gravel, graded from the 1-inch sieve to the No. 4 sieve and compacted to the same density as the adjacent undisturbed earth.

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3. Drainage: Where handholes have drain holes in the bottom, provide two feet minimum of gravel below the drain hole or provide a drain line to the nearest storm drain.
 - B. Grounding:
 1. Provide ground rod through floor in handholes with the top protruding 6 inches above the floor.
 2. Ground exposed metal components and hardware with #2 AWG bare copper ground conductor.
 - C. Hardware: Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cable and conductors and as indicated on Drawings.
 1. Field-Installed Bolting Anchors: Do not drill deeper than 3-7/8 inches for field-installed anchor bolts. Use a minimum of 2 anchors for each cable stanchion.
 - D. Train cables neatly around corners and secure to walls or ceiling using cable clamps with expansion anchors.
- 3.07 IDENTIFICATION
- A. Identify raceways, cables and equipment.
 - B. Provide warning and caution signs as required by the Authority Having Jurisdiction and these specifications.
 - C. Label raceways entering concealed locations from exposed locations as to the destination via the concealed area.
- 3.08 TESTING AND CLEANING
- A. Pull brush through full length of ducts. Use round bristle brush with a diameter 1/2-inch greater than internal diameter of duct. Clean internal surfaces of handholes.
 - B. Duct Integrity: Swab out ducts with a mandrel 1/4 inch smaller in diameter than internal diameter of ducts.

END OF SECTION

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Section 26 05 48 - Seismic Controls for Electrical Work

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes seismic restraints and other earthquake-damage-reduction measures for electrical components.
- B. Related Documents: The provisions and intent of the Contract, the General and Supplementary Conditions, and Division 1 Specification Sections, apply to the Work as if specified in this Section.
- C. Related Sections:
 - 1. Division 26, Section 26 05 00 General Electrical Provisions.

1.2 REFERENCES

- A. ASTM: American Society for Testing and Materials
- B. ICBO: International Conference of Building Officials.
- C. NFPA 70 (National Fire Protection Association) - National Electrical Code.
- D. IBC: International Building Code.

1.3 QUALITY ASSURANCE

- A. Comply with IBC Section 1613, for Seismic Design Category D, Occupancy A-3.
- B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the State of Washington is located and who is experienced in providing seismic engineering services.

1.4 SUBMITTALS

- A. Product Data: Illustrate and indicate types, styles, materials, strength, fastening provisions, and finish for each type and size of seismic restraint component used.
 - 1. Anchor Bolts, Expansion Anchors, Epoxy Anchored Anchors and Studs: Tabulate types and sizes, complete with report numbers and rated strength in tension and shear as evaluated by the International Conference of Building Officials.

1.5 DEFINITIONS

- A. Seismic Restraint: A fixed device, such as a seismic brace, an anchor bolt or stud, or a fastening assembly, used to prevent vertical or horizontal movement, or both vertical and horizontal movement, of an electrical system component during an earthquake.
- B. Mobile Structural Element: A part of the building structure such as a slab, floor structure, roof structure, or wall that may move independent of other mobile structural elements during an earthquake.

1.6 COORDINATION

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Section 26 05 48 - Seismic Controls for Electrical Work

- A. Coordinate layout and installation of seismic bracing with building structural system and architectural features, and with mechanical, fire-protection, electrical, and other building features in the vicinity.
- B. Coordinate concrete bases with building structural system.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. B-Line
 - 2. Erico
 - 3. GS Metals
 - 4. Thomas & Betts
 - 5. Unistrut

2.2 MATERIALS

- A. Use the following materials for restraints:
 - 1. Indoor Dry Locations: Steel, zinc plated.
 - 2. Outdoors and Damp Locations: Galvanized PVC coated steel.
 - 3. Corrosive Locations: Stainless steel.

2.3 ANCHORAGE AND STRUCTURAL ATTACHMENT COMPONENTS

- A. Strength:
 - 1. Allowable or Working Stress Design Capacities shall be as approved by the ICBO for all designs utilizing an Allowable Stress Method.
 - 2. Ultimate Strength Design Capacities shall be as approved by the ICBO for all designs utilizing a Strength Design or Load and Resistance Factor Design Method.
- B. Concrete and Masonry Anchor Bolts and Studs: Steel-expansion wedge type.
- C. Concrete Inserts: Steel-channel type.
- D. Through Bolts: Structural type, hex head, high strength. Comply with ASTM A 325.
- E. Welding Lugs: Comply with MSS SP-69, Type 57.
- F. Beam Clamps for Steel Beams and Joists: Double sided. Single-sided type is not acceptable.
- G. Bushings for Floor-Mounted Equipment Anchors: Neoprene units designed for seismically rated rigid equipment mountings and matched to the type and size of anchor bolts and studs used.

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- H. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for seismically rated rigid equipment mountings and matched to the type and size of attachment devices used.

2.4 SEISMIC BRACING COMPONENTS

- A. Slotted Steel Channel: 1-5/8-by-1-5/8-inch cross section, formed from 0.1046-inch thick steel, with 9/16-by-7/8-inch slots at a maximum of 2 inches on center in webs, and flange edges turned toward web.
 - 1. Materials for Channel: ASTM A 570, GR 33.
 - 2. Materials for Fittings and Accessories: ASTM A 575, ASTM A 576, or ASTM A 36.
 - 3. Fittings and Accessories: Products of the same manufacturer as channels and designed for use with that product.
 - 4. Finish: Baked, rust-inhibiting, acrylic-enamel paint applied after cleaning and phosphate treatment, unless otherwise indicated.
- B. Channel-Type Bracing Assemblies: Slotted steel channel, with adjustable hinged steel brackets and bolts.
- C. Cable-Type Bracing Assemblies: Zinc-coated, high-strength steel wire rope cable attached to steel thimbles, brackets, and bolts designed for cable service.
 - 1. Arrange units for attachment to the braced component at one end and to the structure at the other end.
 - 2. Wire Rope Cable: Comply with ASTM 603.
- D. Hanger Rod Stiffeners: Slotted steel channels with internally bolted connections to hanger rod.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install seismic restraints according to applicable codes and regulations and as approved by authority having jurisdiction unless more stringent requirements are indicated.

3.2 STRUCTURAL ATTACHMENTS

- A. Use bolted connections with steel brackets, slotted channel, and slotted-channel fittings to transmit the design loads.
- B. Attachments to New Concrete: Bolt to channel-type concrete inserts or use expansion anchors.
- C. Attachments to Existing Concrete: Use expansion anchors.
- D. Holes for Expansion Anchors in Concrete: Drill at locations and to depths that avoid reinforcing bars.

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- E. Attachments to Solid Concrete Masonry Unit Walls: Use expansion anchors.
- F. Attachments to Hollow Walls: Bolt to slotted steel channels fastened to wall with expansion anchors.
- G. Attachments to Wood Structural Members: Install bolts through members.
- H. Attachments to Steel: Bolt to clamps on flanges of beams and columns, or on upper truss chords of bar joists.

3.3 ELECTRICAL EQUIPMENT ANCHORAGE

- A. Anchor rigidly to a single mobile structural element or to a concrete base that is structurally tied to a single mobile structural element.
- B. All floor-mounted equipment shall be secured to the housekeeping bases with ductile steel anchor bolts, preset in the concrete base. Secure vibration mounts, where required, to the concrete bases such that the equipment is free to vibrate but cannot move from the base.
 - 1. Housekeeping Bases: Provide appropriately sized concrete housekeeping bases for all floor-mounted equipment unless noted otherwise. Size concrete bases so expansion anchors will be a minimum of 10 bolt diameters from the edge of the concrete base. Bases shall be 4" nominal thick concrete with #4 reinforcing bars each way on 12" centers and doweled to floor slab unless noted otherwise. Trowel finish with 1" bevel edge all around.
 - 2. Bushings for Floor-Mounted Equipment Anchors: Install to allow for resilient media between anchor bolt or stud and mounting hole in concrete.
- C. Wall-Mounted Equipment Fastening: Rigidly secure all flush- or surface-mounted equipment, such as panelboards or cabinets, to the structure. Use expanding type anchors for concrete or masonry construction.
 - 1. Anchor Bolt Bushing Assemblies for Wall-Mounted Equipment: Install to allow for resilient media where equipment or equipment-mounting channels are attached to wall.
- D. Torque bolts and nuts on studs to values recommended by equipment manufacturer.
 - 1. Mark lugs after torquing with red paint such that paint will be visibly disturbed if lugs are disturbed

3.4 SEISMIC BRACING INSTALLATION

- A. Expansion and Contraction: Install to allow for thermal movement of braced components.
- B. Cable Braces: Install snug tight unless otherwise recommended by the manufacturer. Do not exceed the maximum cable slack as recommended by the cable manufacturer.

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Section 26 05 48 - Seismic Controls for Electrical Work

- C. Attachment to Structure: If specific attachment is not indicated, anchor bracing to the structure at flanges of beams and columns, upper truss chords of bar joists, or at concrete members.

3.5 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

- A. Make flexible connections in raceways, cables, wireways, cable trays, and busways where they cross expansion and seismic control joints, where adjacent sections or branches are supported by different structural elements, and where they terminate at electrical equipment anchored to a different mobile structural element from the one supporting them.

END OF SECTION

PART 1 – GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

- A. The provisions and intent of the Contract, the General Conditions and General Requirements, apply to this work as if specified in this section. Work related to this section is described in the following sections:
 - 1. Section 26 05 00 – Common Work Results for Electrical
 - 2. Section 26 05 19 – Low Voltage Electrical Power Conductors and Cables
 - 3. Section 26 05 33 – Raceways and Boxes for Electrical Systems
 - 4. Section 25 09 23 – Lighting Controls
 - 5. Section 26 24 13 – Low-Voltage Switchboards
 - 6. Section 26 24 16 – Panelboards
 - 7. Section 26 27 16 – Cabinets and Enclosures
 - 8. Section 26 27 26 – Wiring Devices

1.02 SUMMARY

- A. This Section includes identification of electrical materials, equipment, and installations.

1.03 REFERENCES

- A. ANSI/IEEE C2 - National Electrical Safety Code.
- B. NFPA 70 (National Fire Protection Association) – National Electrical Code.

1.04 QUALITY ASSURANCE

- A. Comply with NFPA 70, as adopted and administered by the Authority Having Jurisdiction.
- B. Comply with ANSI C2.

1.05 SUBMITTALS

- A. Product Data for each type of product specified.
- B. Provide sample label with identification nomenclature for one of each label type to be used for identification and equipment labels.
- C. Contractor shall field stamp one (lid and frame) for Engineer review and approval prior to field stamping all vaults and handholes.

PART 2 - PRODUCTS

2.01 LABEL TYPES

- A. Manufacturer's standard products with colors prescribed by ANSI A13.1, NFPA 70, and these Specifications.
- B. Black felt-tip permanent marker on backside of wiring device coverplate in all locations.
- C. Individual wires shall have flexible, preprinted pre-tensioned wraparound plastic sleeves sized to suit the diameter of the wire it identifies at terminations, and arranged to stay in place by pre-tensioned gripping action when placed in position.

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SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEM

- D. For equipment, engraved melamine plastic laminate flat stock, 1/16-inch minimum thickness for sizes up to 15 square inches. Use 1/8-inch minimum for sizes larger than 20 square inches, white with black letters. Text height shall be ¼" for nameplates on cabinet and equipment interiors, 3/8" height for sub letters on cabinet and equipment exteriors, and ½" height for main letters on cabinet and equipment exteriors. UV-inhibited when used outdoors. Secure with stainless steel drive screws, stainless steel self-tapping screws or stainless steel oval-head 6-32 screws tapped into enclosure, or with stainless steel bolts with elastic stopnut. Do not attach labels with screws or bolts if it voids manufacturer warranty UL listing of equipment. Provide alternate adhesive type label.
- E. Plain-colored vinyl adhesive tape, 3-mil minimum by 1-inch wide minimum, for conductor phase identification. Apply 1/2-inch minimum over-wrap through 2-inch minimum length.
- F. Cable and wire tags shall be plastic, 3" x 1 ½", impact resistant, with rounded corners, white color, with 2 holes at each end for attachment to cables and wires with plastic cable ties. Labels shall be machine printed with black indelible ink, size 20 font, with description having source point, circuit breaker, fused switch, equipment name or equipment ID, and termination location. Labels shall be provided in all power signal vaults and handholes for all wires, cables and pull ropes provided under this contract.
- G. Provide field stamped label on exposed metal frame and lid. Label shall match vault or manhole ID on electrical site plans.
- H. Underground metallic line-warning tape with pre-printed warning message identifying type of system. Material shall be compounded for unlimited life when direct buried. Use when metal-detection of line is required on Medium Voltage Systems. 6-inch minimum width by 4-mils thick. (Reference Seton style 6ELE.)
- I. Warning signs: Baked Enamel on aluminum plate, 0.040-inch minimum thickness. OSHA standard wording where approved. Custom wording if required. Secure with non-corrosive fasteners.
- J. Warning labels: Flexible pressure-sensitive vinyl conforming to OSHA "Danger" and "Caution" standards. 2½ x 1¾" minimum with black letters on yellow background. Label shall read: "WARNING! DO NOT USE AS WALKWAY, LADDER, OR SUPPORT FOR LADDERS OR PERSONNEL – CABLES ADDED AFTER INITIAL INSTALLATION REQUIRE PORT OF TACOMA APPROVAL." (Reference Seton "On-the-Spot.").
- K. Conduit/duct tags shall be 304 Stainless steel, machine or hand-stamped (size 20 font), 1 ½" diameter or 1 ½" square, minimum 40 mils thick with hole for attaching to conduit/duct using stainless steel wire. Use in handholes and vaults, and exposed conduits, with text to identify conduit/duct per the conduit and conductor schedules.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install identification labels according to manufacturer's written instructions.
- B. Install labels where indicated and as required by the Authority Having Jurisdiction. Locate for optimum viewing and without interference with the operation and maintenance of equipment.

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- C. Coordinate names, abbreviations, colors, graphics and other designations used for electrical identification with corresponding designations used in the Contract Documents or as required by codes and standards.

Use consistent designations throughout the Project. Labeling abbreviations are not allowed.

- D. Sequence of Work: Where identification is to be applied to surfaces that require finish, install identification after completion of finish work.

1. Coordinate installing electrical identifying labels prior to installing finishes that conceal such items.

- E. Clean surfaces of dust, loose material, and oily films before applying painted or self-adhesive identification products.

- F. Painted Identification Products:

1. Prime surfaces according to manufacturer's instructions prior to applying painted labels:
 - a. For galvanized metal, use single-component, acrylic vehicle coating formulated for galvanized surfaces.
 - b. For concrete masonry units, use heavy-duty, acrylic-resin block filler.
 - c. For concrete surfaces, use clear, alkali-resistant, alkyd binder-type sealer.
2. Apply one intermediate and one finish coat of paint.

- G. Conductor Identification:

1. Conductors to be Extended in the Future: Indicate source and circuit numbers.
2. Multiple Power or Lighting Circuits in the Same Enclosure: Identify each conductor with source, voltage, circuit number, and phase. Use color coding for voltage and phase indication of secondary circuit.
3. Multiple Control and Communications Circuits in the Same Enclosure: Identify each conductor by its system and circuit designation. Use a consistent system of tags, color coding, or cable marking tape.

- H. Warning, Caution, and Instruction Signs:

1. Install warning, caution, and instruction signs where indicated or required to ensure safe operation and maintenance of electrical systems and of items to which they connect.
2. Warning labels for arc flash shall be 3 ½" x 5" thermal transfer type of high adhesion polyester for each work location analyzed. The label shall have an orange header with the wording "WARNING", a sub-header with the wording "ARC FLASH AND SHOCK HAZARD APPROPRIATE PPE REQUIRED", and shall include the following information:
 - a. Location designation
 - b. Nominal voltage
 - c. Flash protection boundary
 - d. Hazard risk category

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SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEM

- e. Incident energy
- f. Working distance
- g. Engineering report number, revision number, and issue date
- h. Labels shall be machine printed, with no field markings.
- I. Apply equipment identification labels of engraved plastic laminate on each major unit of equipment, including central or master unit of each system. This includes communication, signal, and alarm systems, unless units are specified with their own self-explanatory identification. Except as otherwise indicated, provide a single line of text with 1/4-inch high lettering on 1-inch high label. Use white lettering on black field. Apply labels parallel to equipment lines.
- J. Apply instrument labels on all field-mounted instruments, transmitters, pressure gauges and control valves.

END OF SECTION

DIVISION 26 – ELECTRICAL

Section 26 05 73 – Overcurrent Protective Device Coordination Study

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes computer-based, fault-current, over-current protective device coordination and arc flash studies. Protective devices shall be set based on results of the protective device coordination and arc flash study.

1.3 SUBMITTALS

- A. Product Data: For computer software program to be used for studies.
- B. Product Certificates: For coordination-study and fault-current-study computer software programs, certifying compliance with IEEE 399.
- C. Qualification Data: For coordination-study specialist.
- D. Other Action Submittals: The following submittals shall be made after the approval process for system protective devices has been completed. Submittals shall be in digital form.
 - 1. Coordination-study input data, including completed computer program input data sheets.
 - 2. Study and Equipment Evaluation Reports.
 - 3. Coordination-Study Report.
 - 4. Arc Flash Study Report.

1.4 QUALITY ASSURANCE

- A. Studies shall use computer programs that are distributed nationally and are in wide use. Software algorithms shall comply with requirements of standards and guides specified in this Section. Manual calculations are not acceptable.
- B. Coordination-Study & Arc Flash Study Specialist Qualifications: An entity experienced in the application of computer software used for studies, having performed successful studies of similar magnitude on electrical distribution systems using similar devices for a minimum of five (5) years.
 - 1. Professional engineer, licensed in the state of Washington, shall be responsible for the study. All elements of the study shall be performed under the direct supervision and control of the registered engineer.
- C. Comply with IEEE 242 for short-circuit currents and coordination time intervals.
- D. Comply with IEEE 399 for general study procedures.
- E. Comply with NFPA 70E for arc flash study.

PART 2 - PRODUCTS

2.1 COMPUTER SOFTWARE DEVELOPERS

- A. Available Computer Software Developers: Subject to compliance with requirements, companies offering computer software programs that may be used in the work include, but are not limited to, the following:
- B. Computer Software Developers: Subject to compliance with requirements, provide products by one of the following:
- C. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
 - 1. EDSA Micro Corporation.
 - 2. SKM Systems Analysis, Inc. (Windows based)

2.2 COMPUTER SOFTWARE PROGRAM REQUIREMENTS

- D. Comply with IEEE 399.
- E. Analytical features of fault-current-study computer software program shall include "mandatory," "very desirable," and "desirable" features as listed in IEEE 399.
- F. Computer software program shall be capable of plotting and diagramming time-current-characteristic curves as part of its output. Computer software program shall report device settings and ratings of all over-current protective devices and shall demonstrate selective coordination by computer-generated, time-current coordination plots.
 - 1. Features:
 - a. Arcing faults.
 - b. Simultaneous faults.
 - c. Explicit negative sequence.
 - d. Mutual coupling in zero sequence.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine project over-current protective device submittals for compliance with electrical distribution system coordination requirements and other conditions affecting performance. Devices to be coordinated are indicated on Drawings.
 - 1. Proceed with coordination study only after relevant equipment submittals have been assembled and approved. Over-current protective devices that have not been submitted and approved prior to coordination study may not be used in study.

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Section 26 05 73 – Overcurrent Protective Device Coordination Study

3.2 POWER SYSTEM DATA

- A. Verify that power system data is indicated on Drawings, allowing Contractor to complete the data gathering specified in this Article. Drawing Coordination Checklist may be useful in verification. Gather and tabulate the following input data to support coordination study:
1. Product Data for overcurrent protective devices specified in other Division 26 Sections and involved in overcurrent protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.
 2. Impedance of utility service entrance.
 3. Electrical Distribution System Diagram: In hard-copy and electronic-copy formats, showing the following:
 - a. Circuit-breaker and fuse-current ratings and types.
 - b. Transformer kilovolt amperes, primary and secondary voltages, connection type, impedance, and X/R ratios.
 - c. Generator kilovolt amperes, size, voltage, and source impedance.
 - d. Cables: Indicate conduit material, sizes of conductors, conductor material, insulation, and length.
 - e. Motor horsepower and code letter designation according to NEMA MG 1.
 4. Data sheets to supplement electrical distribution system diagram, cross-referenced with tag numbers on diagram, showing the following:
 - a. Special load considerations, including starting inrush currents and frequent starting and stopping.
 - b. Transformer characteristics, including primary protective device, magnetic inrush current, and overload capability.
 - c. Motor full-load current, locked rotor current, service factor, starting time, type of start, and thermal-damage curve.
 - d. Generator thermal-damage curve.
 - e. Ratings, types, and settings of utility company's overcurrent protective devices.
 - f. Special overcurrent protective device settings or types stipulated by utility company.
 - g. Time-current-characteristic curves of devices indicated to be coordinated.
 - h. Manufacturer and type, ampere-tap adjustment range, time-delay adjustment range, instantaneous attachment adjustment range, and current transformer ratio for overcurrent relays.
 - i. Panelboards ampacity, and interrupting rating in amperes RMS symmetrical.

3.3 FAULT-CURRENT STUDY

- A. Calculate the maximum available short-circuit current in amperes RMS symmetrical at circuit-breaker positions of the electrical power distribution system. The calculation shall be for a current immediately after initiation and for a three-phase bolted short circuit at each of the following:
1. Service panelboard.
 2. Branch circuit panelboards
- B. Calculate momentary and interrupting duties on the basis of maximum available fault current.
- C. Calculations to verify interrupting ratings of overcurrent protective devices shall comply with IEEE 141 and IEEE 242.
1. Transformers:

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Section 26 05 73 – Overcurrent Protective Device Coordination Study

- a. ANSIC57.12.10.
 - b. ANSI C57.12.22.
 - c. ANSI C57.12.40.
 - d. IEEE C57.12.00.
 - e. IEEE C57.96.
2. Low-Voltage Circuit Breakers: IEEE 1015 and IEEE C37.20.1.
 3. Low-Voltage Fuses: IEEE C37.46.

D. Study Report:

1. Show calculated X/R ratios and equipment interrupting rating (1/2-cycle) fault currents on electrical distribution system diagram.

E. Equipment Evaluation Report:

1. For 600-V overcurrent protective devices, ensure that interrupting ratings are equal to or higher than calculated 1/2-cycle symmetrical fault current.
2. For devices and equipment rated for asymmetrical fault current, apply multiplication factors listed in the standards to 1/2-cycle symmetrical fault current.
3. Verify adequacy of phase conductors at maximum three-phase bolted fault currents; verify adequacy of equipment grounding conductors and grounding electrode conductors at maximum ground-fault currents. Ensure that short-circuit withstand ratings are equal to or higher than calculated 1/2-cycle symmetrical fault current.

3.4 COORDINATION STUDY

A. Perform coordination study using approved computer software program. Prepare a written report using results of fault-current study. Comply with IEEE 399.

1. Calculate the maximum and minimum 1/2-cycle short-circuit currents.
2. Calculate the maximum and minimum interrupting duty (5 cycles to 2 seconds) short-circuit currents.
3. Calculate the maximum and minimum ground-fault currents.

B. Comply with IEEE 141, IEEE 242 recommendations for fault currents and time intervals.

C. Transformer Primary Overcurrent Protective Devices:

1. Device shall not operate in response to the following:
 - a. Inrush current when first energized.
 - b. Self-cooled, full-load current or forced-air-cooled, full-load current, whichever is specified for that transformer.
 - c. Permissible transformer overloads according to IEEE C57.96 if required by unusual loading or emergency conditions.
2. Device settings shall protect transformers according to IEEE C57.12.00, for fault currents.

D. Conductor Protection: Protect cables against damage from fault currents according to ICEA P-32-382, ICEA P-45-482, and conductor melting curves in IEEE 242. Demonstrate that equipment withstands the maximum short-circuit current for a time approved to the tripping time of the primary relay protection or total clearing time of the fuse. To determine temperatures that damage insulation, use curves from cable manufacturers or from listed standards indicating conductor size and short-circuit current.

E. Coordination-Study Report: Prepare a written report indicating the following results of coordination study:

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Section 26 05 73 – Overcurrent Protective Device Coordination Study

1. Tabular Format of Settings Selected for Overcurrent Protective Devices:

- a. Device tag.
- b. Circuit-breaker settings.
- c. Fuse-current rating and type.

2. Coordination Curves: Prepared to determine settings of overcurrent protective devices to achieve selective coordination. Graphically illustrate that adequate time separation exists between devices installed in series, including power utility company's upstream devices. Prepare separate sets of curves for the switching schemes and for emergency periods where the power source is local generation. Show the following information:

- a. Device tag.
- b. Voltage and current ratio for curves.
- c. Three-phase and single-phase damage points for each transformer.
- d. No damage, melting, and clearing curves for fuses.
- e. Cable damage curves.
- f. Transformer inrush points.
- g. Maximum fault-current cutoff point.

F. Completed data sheets for setting of overcurrent protective devices.

3.5 ARC FLASH STUDY

A. Perform Arc Flash study and provide electrical equipment labels per NFPA 70E requirements.

1. Arc Flash calculations shall be taken from both the line and load side of overcurrent protective devices. "Arc Flash Labels" shall reflect largest level of potential incident energy during an arc flash. Contract to coordinate with Owner on type, size, format, and font used on the arc flash labels, and provide all "Arc Flash Labels" for the project.

END OF SECTION

DIVISION 26 - ELECTRICAL

Section 26 09 23 – Lighting Controls

PART 1 GENERAL

1.01 SUMMARY

- A. This is a design/build wireless lighting control system. Contractor/supplier shall design and provide the following lighting control system:
 - 1. Acuity Brand ROAM Wireless Lighting Control System, or engineer approved equal.
 - 2. Design of the wireless lighting control system.
 - 3. Provide all components of the wireless control system to provide a functional lighting control system.
- B. Related Documents: The provisions and intent of the Contract, the General and Supplementary Conditions, and Division 1 Specification Sections, apply to the Work as if specified in this Section.

1.02 REFERENCES

- A. NFPA 70 (National Fire Protection Association) - National Electrical Code.
- B. NFPA 101 (National Fire Protection Association) - Life Safety Code

1.03 QUALITY ASSURANCE

- A. Listing and Labeling: Provide electrical components, devices, and accessories that are Listed and Labeled as defined in NFPA 70, Article 100 and marked for intended use for the location and environment in which they are installed.
- B. Comply with 47 CFR 15, Subparts A and B, for Class A digital devices.
- C. Comply with NFPA 70, as adopted and administered by the Authority Having Jurisdiction.

1.04 SUBMITTALS

- A. Product Data: Include dimensions and data on features, components, and ratings.
- B. Shop Drawings: Detail assemblies of standard components, custom assembled for specific application on Project. Indicate dimensions, weights, arrangement of components, and clearance and access requirements.
 - 1. Wiring Diagrams: Detail specific systems tailored to this Project and differentiate between manufacturer-installed and field-installed wiring.
- C. Manufacturer Certificates: Signed by manufacturers certifying that they comply with requirements.
- D. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.
- E. Maintenance Data: For controls to include in maintenance manuals specified in Division 1. Include operation and maintenance manuals.
- F. Warranties: Special warranties specified in this Section.

1.05 WARRANTY

- A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract

DIVISION 26 - ELECTRICAL

Section 26 09 23 – Lighting Controls

Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

PART 2 PRODUCTS

2.01 PRODUCT DESCRIPTION

- A. Wireless lighting control system shall be Acuity Brand wireless lighting control system, or engineer approved equal with all required components to provide a functional lighting control system.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install equipment level and plumb and according to manufacturer's written instructions.
- B. Mount control equipment according to manufacturer's written instructions and requirements in Section 26 05 48 - Seismic Controls for Electrical Work.
- C. Mounting heights indicated are to bottom of unit for suspended items and to center of unit for wall-mounting items.

3.02 IDENTIFICATION

- A. Identify components and power and control wiring.

3.03 CLEANING

- A. Cleaning: Clean equipment and devices internally and externally using methods and materials recommended by manufacturers, and repair damaged finishes.

END OF SECTION

DIVISION 26 – ELECTRICAL
Section 26 24 16 - Panelboards

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Provide all panelboard equipment complete. All equipment shall be dead front type, door in door construction and shall bear the U.L. label. Load centers will not be acceptable.
- B. All panels provided for service entrance locations as defined by the NEC shall be provided with a UL label, "Suitable for Use as Service Entrance Equipment" (SUSE).

1.02 SHOP DRAWINGS

- A. Prepare and submit for review prior to manufacture. Include front view, dimensions, device sizes and layout, list of nameplates and all other information required to demonstrate conformance with contract documents.
- B. Dimensions of panelboards shall not exceed those noted on or scaled from the contract documents.

PART 2 – PRODUCTS

2.01 PRODUCT DESCRIPTION

- A. All project panelboards shall be as shown on the panelboard schedule.
- B. All panelboards shall be fully rated (Series rated panelboards are not acceptable for this project).
- C. All panelboards' buss bars shall be copper.
- D. AIC rating of all panelboards shall be as shown on the drawings.

2.02 ACCEPTABLE MANUFACTURERS

- A. Square D
- B. Eaton
- C. General Electric
- D. Siemens

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Section 26 24 16 - Panelboards

- E. Engineer approved equal

PART 3 – EXECUTION

3.01 GENERAL INSTALLATION

- A. Secure panelboards in place with top of cabinet at 6'-0", above finished grade or floor. Top of cabinet and trim shall be level; trim and door shall fit neatly without gaps, openings or distortion.
- B. Top edges of adjacent panels shall be even.
- C. Provide steel channel support framing where panelboard is free standing. Submit support rack shop drawings for approval prior to fabrication.

3.02 CIRCUIT INDEX

- A. Each panelboard shall be provided with a typewritten index listing each circuit in the panel by number, with its proper designation. Listing shall match circuit breaker arrangements, typically with odd numbers on the left and even numbers on the right.

Mount index with a transparent protective cover inside the cabinet door.

3.03 PANELBOARD NAMEPLATE

- A. Provide phenolic engraved nameplate for each panelboard.

END OF SECTION

DIVISION 26 – ELECTRICAL
Section 26 27 13 – Electrical Service and Metering

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes equipment for electrical service and electricity metering by utility company.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For electricity-metering equipment.
 - 1. Dimensioned plans and sections or elevation layouts.

1.4 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.5 COORDINATION

- A. Electrical Service Connections: Coordinate with utility company and components they furnish as follows:
 - 1. Comply with requirements of utilities providing electrical power services.
 - 2. Coordinate installation and connection of utilities and services, including provision for electricity-metering components.

PART 2 - PRODUCTS

2.1 EQUIPMENT FOR ELECTRICAL SERVICE AND METERING BY UTILITY COMPANY

- A. Meters will be furnished by utility company.
- B. Meter Sockets: Comply with requirements of electrical utility company.
- C. Meter Sockets: Steady-state and short-circuit current ratings shall be per utility coordination study.

DIVISION 26 – ELECTRICAL
Section 26 27 13 – Electrical Service and Metering

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with equipment installation requirements in NECA 1.
- B. Meter will be provided by utility company. Install raceways and equipment according to utility company's written requirements. Provide empty conduits for metering leads and extend grounding connections as required by utility company.

3.2 IDENTIFICATION

- A. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."
 - 1. Series Combination Warning Label: Self-adhesive type, with text as required by NFPA 70.
 - 2. Equipment Identification Labels: Adhesive film labels with clear protective overlay.

END OF SECTION

DIVISION 26 - ELECTRICAL
Section 26 27 26 – Wiring Devices & Plates

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Provide all wiring devices and plates for a complete installation.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Hubbell
- B. Arrow Hart
- C. Leviton
- D. Pass & Seymour

2.02 MATERIALS

- A. Wiring devices shall be specification grade, and the product of a nationally recognized manufacturer regularly engaged in their production.
- B. All wiring devices specified in this section shall be the product of one manufacturer. Each type shall have identical appearance and characteristics.

2.03 DEVICE COLOR

- A. Switch handles and receptacles: Ivory
- B. Paint or other surface finish treatments are not acceptable.

2.04 SWITCHES

- A. Switches shall be 20 ampere, 277 volt, quiet type with plastic handle. Single pole, double pole, 3-way, 4-way or locking type as required. Provide matching styles and color in other devices as required for the conditions of installation.

2.05 RECEPTACLES

- A. Duplex NEMA 5-20R configuration (20 amp, 125V), GFCI Receptacles 20A-125V duplex receptacle with trip indicator light and single NEMA 3R and "While In Use" weatherproof cover.

DIVISION 26 - ELECTRICAL
Section 26 27 26 – Wiring Devices & Plates

PART 3 - EXECUTION

3.01 MOUNTING

- A. Rigidly fasten each device to the box at proper position with the wall to bring device flush with plate or switch handle the proper distance through the plate.

3.02 ORIENTATION

- A. Set switches vertical with handle operating vertically, up position "ON" and +42" above finished floor.

3.03 RECEPTACLE GROUNDING

- A. Provide bare bonding wire between receptacle grounding terminal and box. Plaster ear screws connecting the receptacle frame to the box will not be acceptable for grounding.

3.04 HANDICAPPED ACCESS

- A. Comply with requirements of Washington State handicapped access code.

3.05 RECEPTACLE TESTS

- A. Receptacles shall be checked to insure proper line to neutral, line to ground and neutral to ground voltages.

END OF SECTION

DIVISION 26 – ELECTRICAL
Section 26 28 16 – Disconnects & Fused Switches

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Provide all disconnect switches required by NEC for equipment furnished under this and other divisions of these specifications and by the Owner.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Siemens
- B. General Electric
- C. Square D
- D. Cutler Hammer

2.02 DISCONNECT SWITCHES

- A. Switches shall be NEMA type HD (heavy duty), quick make, quick break, dual rated with electrical characteristics as required by the system voltage and the load served. Switches shall be single throw and have blades to open all ungrounded conductors.
- B. Enclosure shall have interlocking cover to prevent opening door when switch is closed. Interlock shall include a defeating scheme for authorized service work.
- C. Operator handle shall be lockable in the "off" position.
- D. Disconnect enclosures shall be suitable for mounting locations. Provide NEMA 3R for damp or exterior locations. Provide other NEMA ratings to suit area requirements.
- E. All disconnect switches shall be the product of one manufacturer to facilitate future maintenance.

2.03 FUSIBLE DISCONNECTS

- A. Fusible disconnect switches provided shall be per 2.02 above with the addition of fuse space and clips to accept only Class R fuses.

DIVISION 26 – ELECTRICAL
Section 26 28 16 – Disconnects & Fused Switches

2.04 NAMEPLATES

- A. Provide nameplates on all disconnects and fused switches. Nameplates shall be engraved laminated phenolic mounted with screws. Adhesive only will not be acceptable. Each nameplate shall include this information: Load served, voltage, phase, panel, circuit number, fuse size and type.

PART 3 - EXECUTION

3.01 SUPPORT

- A. Secure disconnect switches to building structure, equipment unit or approved mounting frame. Support by conduit system only is not acceptable.

3.02 SPLICES

- A. Wiring space within disconnect switches shall not be used for splicing; provide suitable junction boxes for this purpose.

END OF SECTION

DIVISION 26 – ELECTRICAL
Section 26 56 00 – Exterior Lighting

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Provide the site lighting system complete and operational, in accordance with the drawings and these specifications.
- B. Install Port of Tacoma furnished LED lighting fixtures and poles of types listed on the drawings. Contractor to provide all necessary receptacles, enclosed circuit breakers, disconnects, pullboxes, conduit, wiring, light fixture mounting hardware and glare control hardware.
- C. Provide all concrete foundations for all poles as shown on the drawings.
- D. All metal fabrications are to be galvanized steel after fabrication. The work shall consist of furnishing all materials, labor, and equipment for fabricating and/or repairing, galvanizing, and erecting metal fabrications, all in accordance with the drawings, notes, and this specification.

1.02 LIGHTING PERFORMANCE

- A. The lighting fixture manufacturer shall supply lighting equipment and computer-generated point by point analysis to meet the following:
 - 1. Spill/Glare Light - Designated Areas
 - a. LED B-U-G (Backlight, Up-light, Glare) rating shall be as specified below:

Holophane HMLED:	B5-U0-G5
AEL ATB2:	B3-U0-G4
Lithonia KBR8 LED:	B1-U1-G1
- B. Point by Point Analysis
 - 1. Computer Models - Test Stations
 - a. Field test stations for the horizontal field measurements shall consist of points on an equally spaced 30' by 30' grid.
 - b. All fixtures shall use 0.90 Light Loss Factor.

DIVISION 26 – ELECTRICAL
Section 26 56 00 – Exterior Lighting

- c. Average minimum horizontal foot-candles within the project area shall be 3 fc, 0.7 minimum horizontal fc, and maximum – to-minimum ratio of 9.57 or less.

PART 2 – PRODUCTS

2.01 PRODUCT DESCRIPTION

- A. All light poles and luminaires have been purchased by the Port of Tacoma. Contractor shall coordinate with the Port, retrieve them from storage, and install at the site per contract documents.
- B. Concrete pole foundations/bases will be as shown on the structural drawings. Electrical Contractor will provide all concrete pole foundations/bases.

PART 3 - EXECUTION

3.01 SETTING POLES

- A. All pole bases shall be carefully set to within 2 feet of designated spot. Refer to civil site plan for exact locations.
- B. Luminaire poles shall be installed plumb.
- C. Pole bases above grade shall be painted safe yellow.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. The work includes excavation, trenching, shoring, filling, backfilling, subgrade preparation, grading, and compaction.
- B. Excess soil and aggregate generated as a result of the work may be re-used on site if the material meets the requirements for Fill or Backfill. If the material does not meet the aggregate gradation for Fill or Backfill, the material may be exported off-site and disposed of, or may be blended with additional aggregates to meet the grading requirements for Fill or Backfill. Use of on-site material as Fill or is subject to approval by the Engineer as described in these specifications. Physical and/or chemical characterization of excess materials may be required and will be provided by the Port as determined by the Engineer.

1.02 QUALITY ASSURANCE

- A. On-site Testing and Inspection: The Port will provide and pay for on-site testing and inspection services. Sampling and testing for compliance with the contract provisions will be in accordance with Section 01 45 00 – Quality Control. The Contractor shall assist in obtaining samples and may obtain copies of test results performed by the Port at no cost. Tests conducted for the sole benefit of the Contractor shall be at the Contractor's expense.
- B. Compaction Control Tests: The Port will provide and pay for laboratory and on-site field compaction control tests in accordance with the applicable provisions of these specifications.
 - 1. The compaction control density shall be the maximum density at optimum moisture content as determined by ASTM D 1557, Standard Methods for Moisture-Density Relationships of Soil and Soil Aggregates, Methods B, C or D as applicable, but shall be no less than 95% of dry density for fill, backfill, crushed surfacing and trench backfill above the bedding zone. Compact trench bedding zone material to 90% of dry density.
 - 2. Field tests to determine in-place compliance with required densities as specified, shall be performed in accordance with ASTM D 1556, D 2167, or D 2922.
- C. Shoring shall be provided in accordance with Specification 31 41 00 – Shoring and Underpinning, applicable local, State and Federal safety codes. Design, agency approval, permits, construction, maintenance, and removal of all shoring elements are the sole responsibility of the Contractor

1.03 SUBMITTALS

- A. Submit in accordance with Section 01 33 00 – Submittal Procedures, the following:
 - 1. Source characterization, testing, reporting, and certification for all off-site borrow materials.
 - 2. Written request for use of on-site borrow materials.
 - 3. Samples of on-site borrow material for physical and/or chemical characterization as requested by the Engineer.

4. See Section 01 35 43.19 – Export Soil Management for requirements for Soils Management Plan submittal.

1.04 SITE CONDITIONS

- A. Subsurface investigations have been made at and near Parcel 77 in connection with this Project. Review and make determinations about the anticipated soil and foundation conditions from the information and report described in Section 00 31 00 – Available Project Information.
- B. Anticipate encountering groundwater at any location within the project site. The groundwater elevation varies depending upon proximity to the shoreline, soil conditions, tidal conditions, and weather. See Section 31 23 19 – Dewatering.
- C. Verify the location of existing utilities at the site, and use an independent private locate company to assist. Those utilities which are to remain shall be protected from damage and remain operational. Damage to utilities which are to remain shall be repaired by the Contractor at its own expense.

PART 2 - PRODUCTS

2.01 FILL AND BACKFILL

- A. Material used for fill and backfill shall be clean, free-draining, sandy gravel or gravelly sand obtained from natural deposits or from excess soils generated during site construction activities. Individual particles shall be free from all objectionable coating. The material shall contain no organic matter or soft friable particles considered objectionable by the Engineer.
- B. Material used for fill and backfill shall be one of the following:
 1. Material from excavation, trench excavation or other on-site borrow soils generated during construction at the site, as approved by the Engineer in accordance with paragraph 2.08, free from organic matter, demolition debris, or other deleterious substances, and containing no rocks or lumps over 6 inches in greatest dimension, except where otherwise approved by the Engineer. "Nesting" of rock pieces that will create voids will not be permitted. Characterization of on-site common borrow materials shall be completed by the Port as directed by the Engineer.
 2. Imported fill material consisting of bank run gravel for trenches meeting the requirements of Washington State Department of Transportation Standard Specifications Section 9-03.19. The amount of fines shall not exceed 5 percent based on the minus ¾-inch fraction. Off-site borrow materials shall be characterized as specified in sections 2.07 and 2.09 at the Contractor's expense.

Material shall be graded between the limits specified below:

<u>Sieve Size</u>	<u>Percent Passing (by weight)</u>
8-inch	100
4-inch	95-100
3/4-inch	60-90
U.S. No. 10	25-65
U.S. No. 40	10-40
U.S. No. 200	0-4

The moisture content of fill material shall be within minus 2 percent to plus 1 percent of the optimum moisture content at the time of compaction.

2.02 GRAVEL BORROW

Gravel Borrow shall meet the requirements of Specification 32 11 23 – Crushed Surfacing. Imported gravel base shall be characterized as specified in paragraphs 2.07 and 2.09 at the Contractor's expense.

2.03 GRAVEL BACKFILL FOR PIPE ZONE BEDDING

Gravel backfill for pipe zone bedding shall consist of crushed, processed or naturally occurring granular material. It shall be free from various types of wood waste or other extraneous or objectionable materials. It shall have such characteristics of size and shape that it will compact and shall meet the following specifications for grading and quality:

<u>Sieve Size</u>	<u>Percent Passing (by weight)</u>
1-1/2" square	100
1" square	75-100
5/8" square	50-100
U.S. No. 4	20-80
U.S. No. 40	3-24
U.S. No. 200	10.0 Max.
Sand Equivalent	35 min.

Imported bedding material shall be characterized as specified in sections 2.07 and 2.09 at the Contractor's expense.

2.04 GRAVEL BACKFILL FOR DRAINS

Gravel Backfill for Drains shall conform to the following gradation:

<u>Sieve Size</u>	<u>Percent Passing (by weight)</u>
1" square	100
3/4" square	80-100
3/8" square	0-40
U.S. No. 4	0-4
U.S. No. 200	0-2

Imported bedding material shall be characterized as specified in sections 2.07 and 2.09 at the Contractor's expense.

2.05 PEA GRAVEL

Pea gravel material must be non-plastic, rounded to sub-rounded aggregate material. A minimum of 70 percent by weight of the pea gravel must have at least one fractured face. Pea gravel shall conform to the following gradation:

<u>Sieve Size</u>	<u>Percent Passing (by weight)</u>
3/8" square	95-100
U.S. No. 4	0-30
U.S. No. 8	0-15
U.S. No. 200	0-2

Imported pea gravel material shall be characterized as specified in sections 2.07 and 2.09 at the Contractor's expense.

2.06 QUARRY SPALLS

- A. Quarry spalls shall meet the requirements of the Washington State Department of Transportation Standard Specifications Sections 9-13. Quarry spalls shall be characterized as specified in sections 2.07 and 2.09 at the Contractor's expense.

2.07 OFF-SITE BORROW SOURCE CHARACTERIZATION

- A. Off-site borrow source characterization shall be performed by the Contractor as specified in Section 2.09 to assure that imported materials are natural, native, virgin materials, free of contaminants, including debris or recycled materials, and meet the requirements of the contract documents.
- B. Each source of off-site borrow material shall be tested once per year for physical properties.
- C. Each source source of off-site borrow for sands and gravels shall be tested once per calendar year for metals.
- D. Each source of off-site borrow for soils, including materials to be used for fill and backfill, shall be tested for metals, chemical compounds and hydrocarbons once for every 500 cubic yards of material to be imported.
- E. The Engineer maintains the right to reject any materials that have been determined to be substandard for any reason. In the event of rejection, it shall be the responsibility of the contractor to remove all stockpiles of rejected material from the site.

1. General

Materials shall of the quality, size, shape, gradation, or equal to that manufacture as specified herein. The Contractor shall submit a characterization of any and all imported material prior to any on-site placement. The characterization will include source identification, analyses of a material source sample, and a source inspection report. The material shall not be imported to the site until approved by the Engineer. Once approved and imported to the site, the Contractor shall perform an on-site inspection of the material to verify that it is the material sampled for characterization and approval.

2. Source Identification

The Contractor shall provide documentation of the origin of imported materials and maps identifying specific location(s) of material source(s). Physical and chemical characterization reports available from the material supplier shall be provided to the Engineer.

3. Inspection of Source

The Contractor shall inspect all material sources. During such inspection, the Contractor shall assure that materials to be delivered to the jobsite are likely to meet the appropriate specifications. The Contractor shall provide the Engineer two weeks notice of such inspections. The Engineer or a designated representative may accompany the Contractor to witness such inspections. This witnessing shall

in no way release the Contractor from complying with the specifications and in no way shall be construed as approval of any particular source of material.

4. Testing, Reporting, and Certification

Off-site borrow materials shall be in accordance with the requirements of Section 2.09 unless waived by the Engineer.

5. Inspection of Materials at the Jobsite

The Contractor shall visually inspect import material upon delivery. Materials shall be inspected for presence of foreign, recycled, or reprocessed material. The Engineer may at any and all times perform an independent inspection. Material may be tested according to Section 2.09 at the Engineer's discretion. Material may be rejected due to the presence of deleterious substances or as a result of substandard test results.

2.08 ON-SITE BORROW SOURCE CHARACTERIZATION

- A. Excavated in-situ soils generated during site construction activities may be used or reused as backfill material, if approved by the Engineer. It is to be assumed that all excavated in-situ material will be found acceptable for reuse.
 - 1. Submit a written request for use of on-site borrow materials at least 3 weeks prior to on-site placement. Identify the source of the excavated material, proposed on-site use, and quantity of material to be used.
 - 2. Provide samples of the material for physical and/or chemical characterization as requested by the Engineer. The material shall not be reused at the site until approved by the Engineer.
 - 3. Characterization and characterization testing of excavated materials proposed for reuse may be performed by the Port, as determined by the Engineer, to assure that materials meet the requirements of the contract documents.
- B. The Engineer may reject any materials that have been determined to be substandard or contain regulated materials. One or more of the tests listed in these specifications may be required prior to acceptance

2.09 CHARACTERIZATION TESTING, REPORTING, AND CERTIFICATION OF OFF-SITE MATERIAL

- A. The Contractor shall provide characterization and testing as described below for off-site borrow materials. Testing results shall meet the Port of Tacoma Import Material Screening Criteria to be considered acceptable.
- B. The Contractor shall provide test sample(s) of excess materials to be exported. The sample data shall be provided at 21 days before proposed export of the materials.
- C. The Contractor is responsible for all testing costs associated with characterization of off-site borrow materials. The Port is responsible for testing costs associated with on-site borrow materials and excess materials to be exported.
- D. The Contractor shall provide the following information with each sample submitted:
 - 1. Material Source
 - 2. Proposed On-site Use

3. Sampling dates
4. Chain of custody
5. Sampling locations
6. Contractor's certification that the samples submitted are representative of the materials that shall be used at the site.

E. Characterization Testing shall include:

1. Physical Properties:
 - a. Grain Size Distribution (ASTM D 422-63)
 - b. Maximum Dry Density (ASTM D1557)
2. Metals and Chemicals:
 - a. Import Material Screening Criteria as indicated in Table 31 00 00 - 1 – Import Material Screening Criteria
 - b. Petroleum Hydrocarbons (NWTPH-Gx (Gasoline) and -Dx (Diesel/Oil))

Table 31 00 00 - 1 – Import Material Screening Criteria

Chemical / Metal Name	Gravel/Rock Criteria (mg/kg)	Soil Criteria (mg/kg)
Volatile Organic Compounds (EPA Method 8260)		
Benzene	-	0.004
Ethylbenzene	-	6.0
Toluene	-	7.0
Xylenes	-	9.0
Tetrachloroethylene (PCE)	-	0.05
Semi-Volatile Organic Compounds (EPA Method 8270)		
acenaphthene		97.9
anthracene		2,275
benzo[a]anthracene		0.130
benzo[a]pyrene		0.1
benzo[b]fluoranthene		0.440
benzo[k]fluoranthene		13.7
benzoic acid	-	257
benzyl alcohol	-	8,000

bis(2-ethylhexyl) phthalate	-	13.9
chrysene	-	95.5
benzyl butyl phthalate	-	12.8
cresol;o-	-	2.3
cresol;p-	-	8,000
dibenzo[a,h]anthracene	-	0.1
dibenzofuran	-	80
di-butyl phthalate	-	56.5
dichlorobenzene;1,2-	-	8.4
dichlorobenzene;1,4-	-	0.2
diethyl phthalate	-	72.2
dimethylphenol;2,4-	-	1.3
di-n-octyl phthalate	-	800
fluoranthene	-	631
fluorene	-	101
hexachlorobenzene	-	0.09
hexachlorobutadiene	-	0.6
indeno[1,2,3-cd]pyrene	-	1.2
methyl naphthalene;2-	-	320
naphthalene	-	0.006
nitrosodiphenylamine;N-	-	0.0009
pentachlorophenol	-	0.003
phenol	-	11
pyrene	-	655
trichlorobenzene;1,2,4-	-	0.06
Pesticides / PCBs (EPA Method 8081/8082)		
ddd	-	0.3
dde	-	0.4
ddt	-	2.9
Polychlorinated biphenyls (PCBs)	-	0.5
Metals (EPA Method 6010/6020/7041)		
Arsenic	13.8	13.8
Cadmium	2.0	2.0

Chromium (total)	113	113
Chromium (VI)	-	0
Copper	36	36
Lead	250	250
Mercury	0.14	0.14
Nickel	61	61
Zinc	100	100
Petroleum (NWTPH-Gx and NWTPH-Dx)		
NWTPH-Gx		2000
NWTPH-Dx		2000

PART 3 - EXECUTION

3.01 GENERAL

- A. Excavating, filling and grading shall be completed within the tolerances established or within reasonably close conformity with the alignment grade and cross sections indicated on the Drawings or as established within these specifications.

3.02 EXCAVATION

- A. Excavation: Shall be the naturally occurring earth, sand, gravel, clays, or mixtures of the above, required to be moved for the construction of crushed surfacing and pavements, slopes, approaches, vehicle parking and circulations areas, building pads, service yard and associated work.
1. Excavation material shall be moved with the use of mechanical equipment, such as shovels, loaders, bulldozers, graders, rippers, etc., but shall not require drilling and blasting or drilling and line breaking.
 2. Excavation by sluicing method will not be permitted unless specifically approved by the Engineer.
 3. In general, excavation shall be removed in horizontal layers in such a way that the resulting material will be a reasonable blend of the naturally occurring materials.
- B. Protect excavated material, stockpiled for reuse as fill or backfill, from contamination by other materials and from weather damage by covering with waterproof sheeting and other effective means. Any material not properly protected which becomes unsuitable or contaminated shall be replaced at no additional cost to the Port.
- C. Separate stockpiles shall be employed for material to be reused as backfill, unsuitable material, and suspect material. At end of project, any material remaining in temporary "material acceptable for reuse" stockpiles shall be considered surplus / excess material, and following testing of material by the Port, Contractor shall haul excess material off-site to a Port approved disposal facility that is appropriate for the material being disposed. Disposal of material off-site prior to end of project, when there is still

potential the material may be needed for backfill, shall first be approved by the Engineer.

- D. Unsuitable Excavation: Shall consist of unstable materials, such as peat, muck, water impregnated clays, swampy or other undesirable materials, including buried logs, stumps, or trash. Unsuitable excavation materials shall be removed to the depth designated by the Engineer.

Unsuitable material excavated shall be replaced with Gravel Backfill for Drains per paragraph 2.04 as directed by the Engineer.

Unsuitable materials, excess material and excavated material not approved by the Engineer for use as fill or backfill shall be transported off-site by the Contractor in accordance with Section 01 35 43.19, Export Soil Management.

3.03 EXCAVATION FOR TRACK, STRUCTURES AND UTILITIES

- A. Excavate as necessary for track, structure and utilities to the lines and grades indicated on the drawings.
- B. Excavation below the designed depth, except as directed by the Port, shall be backfilled with quarry spalls, or other suitable backfill material as approved by the Engineer and compacted as specified, at no extra cost to the Port.
- C. Brace and shore sides of excavations. Comply with all federal, state, and local regulations regarding shoring, bracing, and other protection requirements.
- D. Keep water out of excavated pits and trenches by pumping or other means of dewatering. Water level shall be kept below the bottom of concrete pours before, during, and for a minimum of three days thereafter.
- E. Protect excavated material, stockpiled for use as backfill, from contamination by other materials and from damage by weather by covering with waterproof sheeting or other suitable means.

3.04 FILL AND EMBANKMENT

- A. Place material used for the construction of fill or embankment in horizontal layers upon earth which has been stabilized or otherwise approved by the Engineer for embankment construction.

Irrespective of the method of compaction specified, at the time of compaction the moisture content of that portion of the embankment material passing a U.S. No. 4 sieve shall be not more than three (3) percentage points above or below the optimum moisture content at 100% density as determined by Compaction Control Density Tests, described in Article "Compaction Control Tests" these specifications.

Construct earth embankment in compacted layers of uniform thickness. Carry the layers up full width from the bottom of the embankment. Compact the slopes of all embankments to the required density as part of the embankment compaction work. The embankment shall be compacted with modern, efficient compacting units satisfactory to the Engineer. The compacting units may be of any type, provided they are capable of compacting each lift of the material to the specified density. The right is reserved for the Engineer to order the use of any particular compacting unit discontinued if it is not capable of compacting the material to the required density.

within a reasonable time, or if the equipment may damage underlying or adjacent soils or structures.

Construct earth embankments in successive horizontal layers not exceeding 8 inches in loose thickness except that the layers in the top 2-feet shall not exceed 4-inches in loose thickness. Compact each layer of the top 2-feet of embankment to 95% and each layer of embankment below the top 2-feet to 90% of the maximum density as determined by compaction control tests. Use small mechanical or vibratory compactor units to compact the layers adjacent to structures that are inaccessible to the loaded haul equipment or other compaction rollers.

3.05 FILL, BACKFILL AND COMPACTION FOR STRUCTURES AND UTILITIES

- A. Trenches for all underground structures including manholes, catch basins, oil/water separators, treatment vaults, flow splitters, vaults, handholes and/or other structures, shall be over excavated by one foot. The subgrade shall be prepared, and a minimum of 12 inches of Gravel Backfill for Drains, or more if specified on the Drawings shall be placed and compacted. If subgrade is soft and cannot be adequately compacted, contact Engineer for direction.
- B. Place backfill and structural backfill to lines and grades indicated on the Drawings.
- C. Remove water from excavated areas, by pumping or other means, before placing any fill material.
- D. Compact subgrade, as specified in paragraph 3.06, before placing any fill or backfill material.
- E. Do not place any fill against concrete walls/structures until the concrete has attained its specified design strength and/or certain other construction sequence criteria, if noted on the drawings, are met, or as specifically approved by the Port.
- F. Pipe zone bedding material shall provide uniform support along the entire pipe barrel, without load concentration at joint collars or bells. All adjustments to line and grade shall be made by scraping away or filling in with bedding material under the body of the pipe and not by blocking or wedging. Bedding disturbed by pipe movement, or by removal of shoring movement of a trench shield or box, shall be reconsolidated prior to backfill. Pipe zone bedding shall be placed in loose layers and compacted to 90 percent maximum density. Bedding shall be placed, spread, and compacted before the pipe is installed so that the pipe is uniformly supported along the barrel. Lifts of not more than 6 inches in thickness shall be placed and compacted along the sides of the pipe to the height shown in the Drawings. Material shall be worked carefully under the pipe haunches and then compacted. If the Engineer determines that the material existing in the bottom of the trench is satisfactory for bedding the pipe, the existing material shall be loosened, regraded, and compacted to form a dense, unyielding base.
- G. Backfill by placing material in horizontal layers not exceeding 8-inches upon earth which has been undisturbed, stabilized, or otherwise approved by the Engineer.
 - 1. Construct in compacted layers of uniform thickness. Carry the layers up full width from the bottom. Compact with modern, efficient compacting units, or as directed by the Engineer. The compacting units may be of any type, provided they are capable of compacting each lift of the material to the specified density. The

Engineer may order the use of any particular compacting unit discontinued if it is not capable of compacting the material to the required density within a reasonable time, or if the equipment may damage underlying or adjacent soils or structures.

2. Unless noted elsewhere compact each layer to 95% of the maximum density as determined by compaction control tests described in Paragraph 1.04 above. Use small mechanical or vibratory compactor units to compact the layers adjacent to structures that are inaccessible to other compaction equipment.

3.06 COMPACTION

- A. Compaction shall be performed with approved compaction equipment suited to the soil and the area being compacted. Moisten or aerate material as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction with the equipment used. Each lift of material placed shall be uniformly compacted to the density indicated for the specific material and use set forth in these Specifications. The percent of density required is in relation to the maximum density obtainable at optimum moisture content (Compaction Control Density) as determined in paragraph 3.07 "Compaction Control Tests."

3.07 COMPACTION CONTROL TESTS

Laboratory and field tests shall be performed in accordance with the applicable provisions of these Specifications.

- A. Compaction control density shall be the maximum density at optimum moisture content as determined by ASTM D 1557, Standard Methods for Moisture Density Relationships of Soil and Soil Aggregates, Methods B, C or D as applicable but shall be no less than 95% of dry density for Select Fill and Backfill and no less than 98% of dry density for Base Course Material.
- B. Field tests to determine in place compliance with required densities as specified, shall be performed in accordance with ASTM D1556, D2167, or D2922.

3.08 PREPARATION FOR CRUSHED SURFACING:

- A. Preparation of Subgrade
 1. Immediately prior to placement of surfacing materials, clean the entire width of the area of all debris and dispose of as directed by the Engineer. All depressions or ruts which contain storm water shall be drained.
 2. Shape the entire subgrade to a smooth uniform surface, true to line, grade, and cross section as staked by the Engineer. Compact the subgrade material to 95% of the maximum density as determined by compaction tests ASTM Designation D1557. If soft or spongy material underlying the upper eight inches of the area being prepared precludes satisfactory compaction of the upper eight inches, loosen, aerate, or excavate, replace and compact to the required density as directed by the Engineer.
 3. Remove and dispose of excess material which cannot be disposed of by normal drifting to low spots during blading and shaping operations or by placing in subgrade areas deficient in materials or by wasting, all as directed by the Engineer. Subgrade areas deficient in materials shall be brought to grade by importing suitable materials from other subgrade areas or other sources as directed by the Engineer. Materials added to subgrade areas deficient in materials

shall be watered and compacted as necessary to yield a true finished subgrade as described above.

4. Once it is prepared, maintain the subgrade for surfacing in the finished condition until the first course of surfacing has been placed.

B. Finishing Subgrades

1. Before any paving or base material is placed, the subgrade shall be brought to the proper line, grade and cross section and shall be so maintained until the crushed surfacing and paving is placed.
2. Compact the subgrade for pavement to 95% of maximum density as defined for Compaction Control Density, Article "Compaction Control Tests" these Specifications, to a minimum depth of six inches.

C. Subgrade Protection

1. Take all precautions necessary to protect the subgrade from damage; hauling over the finished subgrade shall be limited to that which is essential for construction purposes.
2. Equipment used for hauling over the prepared subgrade which, in the opinion of the Engineer, is causing undue damage to the prepared subgrade or to the underlying materials, shall be removed from the work at the request of the Engineer.
3. Repair at the Contractor's expense all cuts, ruts and breaks in the surface of the subgrade prior to placing surfacing, treated base, or paving materials.
4. Protect the prepared subgrade from both the Contractor's traffic and public traffic and maintain the subgrade by blading and rolling as frequently as may be necessary to preserve the subgrade in a completely satisfactory condition.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. This work includes all necessary measures to keep excavations and pipe trenches dry during construction. The work covered by this specification consists of providing all supervision, labor, materials, and equipment required to dewater excavations and trenches.

1.02 SITE CONDITIONS

- A. The Contractor should anticipate encountering groundwater in excavations. The Port has subsurface investigations made at and near the project site, the information is available for review as described in Section 00 31 00.
- B. All water removed from trenches and excavations shall be discharged to the City of Tacoma sanitary sewer in accordance with the conditions of the Special Authorization to Discharge obtained by the Port.

1.03 QUALITY CONTROL

- A. It shall be the sole responsibility of the Contractor to control the rate and effect of the dewatering operations in such a manner as to avoid all objectionable settlement and subsidence.
- B. All dewatering operations shall be adequate to ensure the integrity of the finished project and shall be the responsibility of the Contractor.

1.04 SUBMITTALS

- A. The Contractor shall submit a dewatering plan which addresses the methods proposed in dewatering excavations and trenches and handling the dewatering discharge in accordance with the City of Tacoma Special Authorization to Discharge.
- B. Dewatering plan shall include:
 - 1. Water pumping, conveyance and storage equipment.
 - 2. Anticipated pumping rates and durations.
 - 3. Water treatment best management practices.
 - 4. Water discharge.
 - 5. Schedule for completion of work within the trench.
 - 6. Sequence of installation and removal for dewatering measures.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Products that are required to accomplish, or to be incorporated into, the work of this Section shall be as selected by the Contractor, subject to review by the Engineer.

2.02 EQUIPMENT

- A. The Contractor shall have available on this site of work sufficient pumping equipment and/or other machinery to ensure that the operation of the dewatering system can be maintained.

PART 3 - EXECUTION

3.01 GENERAL

- A. Site work for excavations and pipe trenches shall be kept free from water to facilitate fine grading, construction of structures, the proper laying and joining of pipe and appurtenances, and placement of backfill material. Adequate pumping equipment shall be provided to handle and dispose of the water without damage to adjacent property. Trenches shall be dewatered if, at the decision of the Engineer, the quantity of water present prevents the proper installation of structures, pipes and ductbanks. Water in pipe trenches shall not be allowed to flow through the pipe.
- B. The Contractor shall provide and maintain at all times during construction, ample means and devices with which to promptly remove and properly dispose of all water entering trenches and excavations and other parts of the work, whether the water be surface water or underground water. No piping shall be laid in water, nor shall water be allowed to rise over them until the concrete or mortar has set at least 24 hours or until the pipeline has been adequately backfilled to prevent buoyancy. No embankment material shall be placed in standing water. The Contractor shall be responsible for obtaining all water discharge permits as required. No water shall be discharged to areas or work built or under construction.
- C. Water shall be disposed of in such a manner as not to be a nuisance or menace to the public health.
- D. Written permission shall be secured from the Engineer before locating any wells, well points, or drain lines for purposes of dewatering within the limits of an excavation. The Engineer shall have the right to require that any dewatering well, line, or trench drains left in place within the excavation limits be filled with concrete or grout as herein specified, and shown on the Record Drawings.
- E. Dewatering of excavations must be controlled to prevent damage from settlement due to possible lowering of the adjacent groundwater table.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. Work herein generally covers trenching, bedding, backfilling and compaction required for installation of site utilities and site storm drainage. Trench excavation and backfill shall include all excavation, backfilling, disposal of surplus and unsuitable material and all other work incidental to the construction of trenches.

1.02 SITE CONDITIONS

- A. The Port has subsurface investigations made at and near the proposed project site. The information is available for review by the Contractor as described in Section 00 31 00, Available Project Information.
- B. The Contractor should anticipate the presence of groundwater at or near the existing ground surface at much of the project site. The groundwater elevation varies depending upon proximity to the shoreline, tidal conditions and weather.

1.03 SUBMITTALS

- A. For each off-site source of material, submit test reports for the following:
1. Grain Size Distribution, ASTM D 422-63.
 2. Weight per unit volume of uncompacted material, ASTM C-29.
 3. Specific gravity of material as determined from absolute volume, in accordance with ASTM No. D854.

PART 2 - PRODUCTS

2.02 BEDDING MATERIAL

- A. Refer for Section 31 00 00 - Earthwork

2.03 BACKFILL MATERIAL

- A. Refer to Section 31 00 00 – Earthwork

2.04 UNDERGROUND MARKING TAPE

- A. Underground marking tape shall consist of inert polyethylene plastic, 4- mil thickness that is impervious to all known alkalis, acids, chemical reagents and solvents likely to be encountered in the soil, with a metallic foil core to provide the most positive detection and pipeline locators.
- B. The tape shall be color coded and shall be imprinted continuously over its entire length in permanent black ink. The message shall convey the type of line buried below and shall also have the word "Caution" prominently shown. Color coding of the tape shall be as follows:

Utility	Tape Color
Stormwater	Green

Electrical	Red
Communications/Fiber Optic	Orange

- C. The width of the tape shall be as recommended by the manufacturer for the depth of installation and detection.

PART 3 - EXECUTION

3.01 STOCKPILING AND DISPOSAL

- A. All excavated material shall be stock piled beside the trench as it is removed and shall be backfilled from this position or wasted offsite. The disposal of excess material shall be performed in accordance with Section 01 35 43.19 – Export Soil Management.

3.02 TRENCH EXCAVATION

- A. The Contractor shall maintain, at all times during the execution of this work, safe and stable excavations. All trench excavation and preparation shall comply with Section 7-08.3(1) of the Washington State Department of Transportation Standard Specifications, 2018 edition.
- B. Unsuitable materials encountered during trench excavation shall be handled as specified in Section 01 35 43.19 – Export Soil Management.

3.03 BEDDING AND BACKFILLING

- A. Backfill trenches with bedding material as specified and as called for on the Drawings. Fine- grade the bedding material to the required slope and excavate to accommodate bell and spigot joints so the entire length of each pipe will be uniformly supported. Trench backfill shall be common material placed in horizontal layers not to exceed eight inches in loose thickness and carefully compacted by the use of small vibratory or mechanical compactors until the cover is one (1) foot above the top of the pipe. Subsequent layers of trench backfill shall not exceed eight inches in loose thickness but may be compacted by any method, which will not exceed the allowable stresses for the pipe. Compaction testing will be performed in conformance with Section 31 00 00 - Earthwork.
- B. Backfill utility structures with structural backfill as specified in Section 31 00 00 Earthwork and as called for on the Drawings.

3.04 COMPACTION

- A. Compaction shall be performed with approved compaction equipment suited to the soil and the area being compacted. Moisten or aerate material as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction with the equipment used. Each lift of material placed shall be uniformly compacted to the density indicated for the specific material and use set forth in these Specifications.

- B. The Contractor shall properly place and compact all bedding and backfill materials to at least 90% of dry density (ASTM D 1557) in the bedding zone and 95% of dry density in trench backfill zone, and shall correct any deficiencies resulting from insufficient or improper compaction of such materials throughout the contract period.

3.05 COMPACTION CONTROL TESTS

- A. Laboratory and field tests shall be performed in accordance with the applicable provisions of these Specifications.
- B. Compaction control density shall be the maximum density at optimum moisture content as determined by ASTM D- 1557, Standard Methods for Moisture- Density Relationships of Soil and Soil Aggregates, Methods B, C or D as applicable.
- C. Field tests to determine in- place compliance with required densities as specified, shall be performed in accordance with ASTM D1556, D2167, or D2922.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. This Section describes the work necessary to furnish, place, maintain and remove shoring required for all structure and trench excavations greater than four (4) feet deep. Shoring shall be provided in accordance with Section 2-09.3(3) D Shoring and Cofferdams of the Washington State Department of Transportation Standard Specifications for Road, Bridge and Municipal Construction, 2018 Edition and applicable local, State and Federal safety codes.
- B. Design, approvals, and construction of all shoring are the exclusive responsibility of the Contractor. A Professional Engineer, licensed in the State of Washington, shall be used to design all aspects of the shoring.

1.02 SITE CONDITIONS

- A. The Contractor should anticipate to encounter groundwater at or near the existing ground surface at much of the project site. The groundwater elevation varies depending upon proximity to the shoreline, tidal conditions and weather.
- B. The Contractor shall ascertain to his own satisfaction the extent and method in which shoring will be required to meet all required safety codes based on the nature of the material in which it will appear, and the extent to which such occurrence of water shall affect his bid.

1.03 SUBMITTALS

- A. Submit plans in accordance with Section 01 33 00, Submittal Procedures, 10 working days prior to beginning excavation, showing proposed shoring methods and construction details.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Products that are required to accomplish, or to be incorporated into, the work of this Section shall be as selected by the Contractor, subject to review by the Engineer.

PART 3 - EXECUTION

3.01 GENERAL

- A. The method of shoring shall be according to the Contractor's design. The design, planning, installation and removal, if required, of sheeting 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 soils below and adjacent to the excavation.
- B. Damages resulting from improper support or from failure to support excavations shall be the sole responsibility of the Contractor.
- C. In trenching operations, the use of horizontal strutting below the barrel of pipe or the use of pipe as support for trench bracing will not be permitted.
- D. Sheet piling and timbers in trench excavations shall be withdrawn in a manner so as to prevent subsequent settlement of the pipe or additional backfill loading which might overload the pipe.

- E. That portion of cribbing or sheeting extending below the springline of pipe shall be left in place unless satisfactory means of reconsolidating bedding or side support disturbed by cribbing or sheeting removal can be demonstrated.
- F. If a movable box is used in lieu of cribbing or sheeting, and the bottom cannot be kept above the spring line of the pipe, the bedding or side support shall be carefully reconsolidated behind the movable box prior to placing initial backfill.

END OF SECTION

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

The work includes the requirements for furnishing, transporting and delivering crushed surfacing. Work includes producing, transporting, and delivering base courses in conformance with these Specifications.

1.02 CHARACTERIZATION TESTING, REPORTING, AND CERTIFICATION OF FURNISHED MATERIAL

Off-site borrow source characterization and testing shall be performed by the Contractor to assure that furnished materials are natural, native, virgin materials, free of contaminants, including debris or recycled materials, and meet the requirements of the contract documents.

Each source of sands and gravels shall be tested once per calendar year for metals.

The Engineer maintains the right to reject any materials that have been determined to be substandard for any reason. In the event of rejection, it shall be the responsibility of the Contractor to remove all stockpiles of rejected material from the site.

A. General

Materials shall be of the quality, size, shape, gradation, or equal to that manufacture as specified herein. The Contractor shall submit a characterization of any and all imported material prior to any material delivery. The characterization will include source identification, analyses of a material source sample, and a source inspection report. The material shall not be delivered until approved by the Engineer. Once approved and delivered to the Port, the Contractor shall perform an on-site inspection of the material to verify that it is the material sampled for characterization and approval.

B. Source Identification

The Contractor shall provide documentation of the origin of imported materials and maps identifying specific location(s) of material source(s). Physical and chemical characterization reports available from the material supplier shall be provided to the Engineer.

C. Inspection of Source

The Contractor shall inspect all material sources. During such inspection, the Contractor shall assure that materials to be delivered to the jobsite are likely to meet the appropriate specifications. The Contractor shall provide the Engineer two weeks notice of such inspections. The Engineer or a designated representative may accompany the Contractor to witness such inspections. This witnessing shall in no way release the Contractor from complying with the

specifications and in no way shall be construed as approval of any particular source of material.

D. Inspection of Materials at the Jobsite

The Contractor shall visually inspect import material upon delivery. Materials shall be inspected for presence of foreign, recycled, or reprocessed material. The Engineer may at any and all times perform an independent inspection. Material may be tested at the Engineer's discretion. Material may be rejected due to the presence of deleterious substances or as a result of substandard test results.

E. The Contractor shall provide characterization and testing as described below for furnished materials. Testing results shall meet the Port of Tacoma Import Material Screening Criteria to be considered acceptable. The Contractor is responsible for all testing costs associated with characterization of furnished materials.

F. Characterization and testing shall include:

1. Physical Properties:

- a. Grain Size Distribution (ASTM D 422-63)
- b. Maximum Dry Density (ASTM D1557)
- c. Sieve analyses for all materials specified in accordance with ASTM C 136.
- d. Los Angeles Wear (ASTM C131)
- e. Degradation Factor (WSDOT Test Method T 113)

2. Metals and Chemicals:

- a. Import Material Screening Criteria as indicated in Table 31 00 00 - 1 – Import Material Screening Criteria

Table 31 00 00 - 1 – Import Material Screening Criteria

Chemical / Metal Name	Gravel/Rock Criteria (mg/kg)	Soil Criteria (mg/kg)
Metals (EPA Method 6010/6020/7041)		
Arsenic	13.8	13.8
Cadmium	2.0	2.0
Chromium (total)	113	113

Chromium (VI)	-	0
Copper	136	136
Lead	250	250
Mercury	0.14	0.14
Nickel	61	61
Zinc	100	100

PART 2 – PRODUCTS

2.01 CRUSHED SURFACING

Crushed surfacing base course and top course shall comply with Section 9-03.9(3) of the Washington State Department of Transportation Standard Specifications for Road, Bridge and Municipal Construction, 2018 edition.

PART 3 – EXECUTION

3.01 EQUIPMENT

All equipment necessary for the satisfactory installation of crushed surfacing shall meet the requirements of Section 4-04.3(1) of the Washington State Department of Transportation Standard Specifications for Road, Bridge and Municipal Construction, 2018 Edition, as amended to provide for the following:

Equip grading machines or trimmers with a spirit level or other type slope indicator which will continuously indicate the average, transverse slope of the screed. Bubble or indicator movement should be no less than 1/8 inch for each 0.1 percent change in transverse slope.

3.02 PREPARATION AND PROTECTION OF SUBGRADE

Prepare and protect subgrade as specified in Section 31 00 00 – Earthwork and obtain approval of the Engineer before placing crushed surfacing materials.

3.03 PLACEMENT OF CRUSHED SURFACING AGGREGATES

- A. Prior to placement Contractor shall blend the various source materials to create a homogenous, well graded, mixture.
- B. Equipment necessary for the satisfactory performance of this construction shall be on the project and approved by the Engineer prior to beginning work. If central-mix-plant methods are used, the central mixing plant shall comply with the applicable portions Section 4-04.3(3) of the WSDOT Standard Specifications, 2018 Edition.

- C. Prepare subgrades as specified above and obtain approval of the Engineer before placing base course or surfacing materials.
- D. Mixing: After each layer of material is placed, mix the material by motor graders or other approved equipment until the mixture is uniform throughout. Add water as directed by the Engineer to facilitate mixing and compacting.
- E. Placing and Spreading: Spread each layer of material by means of approved spreading equipment. Such equipment may be bottom-dump hauling equipment with transverse spreading facilities; self-propelled spreading and leveling machines; or spreader boxes equipped with wheels or so constructed as to preclude damage to the subgrade or underlying courses. Spreading in small areas of less than 2,000 square yards or in areas irregular in shape may be accomplished by other means as directed by the Engineer. Material shall be placed in layers not exceeding six inches.
- F. Shaping and Compacting: Immediately following spreading and shaping, compact each layer to at least ninety five percent (95%) of the maximum dry density determined in accordance with ASTM D-1557 before the next succeeding layer is placed thereon. When the thickness of the base course is less than 0.15 feet, density testing may not be required and the Engineer will determine the number of coverage's required for the particular compaction equipment available.
- G. Vibratory compactors or rollers shall be adequate in design and number to provide compaction and obtain the specified density for each layer while still moist. Apply a mist spray of water as needed to replace moisture lost by evaporation. The completed layer shall have a smooth, tight, uniform surface true to the line, grade and cross section indicated on the Drawings.\
- H. Variations in the surface of the top course shall be a maximum of 1/4 inch in 10 feet. Shave off or fill in variations greater than the allowable and recompact that area.
- I. Surface Maintenance: Maintain the surface of each layer of material true to line, grade and cross section by blading, watering and rolling until placing the succeeding course. Place the first course of material on all available subgrade before placing the succeeding course unless otherwise authorized by the Engineer. Should irregularities develop in any surface during or after compaction, remedy by loosening the surface and correcting the defects, then thoroughly recompact the entire area, including the surrounding surface. In the event that additional materials are necessary to make the repairs, they shall be provided at no additional cost to the Port.
- J. Route hauling equipment over the roadway in such a manner as to be most effective in the compacting of the material. Hauling over the surfacing in the process of construction will not be permitted when, in the opinion of the Engineer, the effect will be detrimental.

END OF SECTION

PART 1 - GENERAL

1.01 SCOPE

- A. The work covered by this Section includes the furnishing of all labor, materials, equipment and necessary services to construct asphalt pavements to the sections and at the locations as specified in this Section and as indicated on the Contract Drawings.

1.02 RELATED SECTIONS

- A. Section 01 33 00 - Submittal Procedures
- B. Section 01 45 00 - Quality Control
- C. Section 31 00 00 - Earthwork

1.03 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.
- B. Unless otherwise indicated, the most recent edition of the publication, including any revisions, shall be used.
- C. American Association of State Highway and Transportation Officials (AASHTO)
 - 1. AASHTO M 17 – Mineral Filler for Bituminous Paving Mixtures
 - 2. AASHTO M 320 – Performance-Graded Asphalt Binder
 - 3. AASHTO M 323 - Superpave Volumetric Mix Design
 - 4. AASHTO T 11 - Materials Finer Than 75 mm (No. 200) Sieve in Mineral Aggregates by Washing
 - 5. AASHTO T 27 - Sieve Analysis of Fine and Coarse Aggregates
 - 6. AASHTO T 89 - Determining the Liquid Limit of Soils
 - 7. AASHTO T 90 - Determining the Plastic Limit and Plasticity Index of Soils
 - 8. AASHTO T 96 - Resistance to Degradation of Small-Size Coarse Aggregate and Impact in the Los Angeles Machine
 - 9. AASHTO T 112 - Clay Lumps and Friable Particles in Aggregate

10. AASHTO T164 - Quantitative Extraction of Asphalt Binder from Hot Mix Asphalt (HMA)
 11. AASHTO T168 – Sampling Hot Mix Asphalt Paving Mixtures
 12. AASHTO T 176 - Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test
 13. AASHTO T 304 - Uncompacted Void Content of Fine Aggregate
 14. AASHTO T308 - Determining the Asphalt Binder Content of Hot Mix Asphalt (HMA) by the Ignition Method
 15. AASHTO T 312 -) Preparing and Determining the Density of Hot Mix Asphalt (HMA) Specimens by Means of the Superpave Gyratory Compactor
 16. AASHTO T 329 – Moisture Content of Hot Mix Asphalt (HMA) by Oven Method
 17. AASHTO T 335 - Determining the Percentage of Fracture in Coarse Aggregate
- D. American Society for Testing and Materials (ASTM)
1. ASTM D75 – Sampling Aggregates
 2. ASTM D2041 – Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
 3. ASTM D2726 – Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Asphalt Mixtures
 4. ASTM D4791 - Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
- E. Washington State Department of Transportation (WSDOT)
1. Construction Manual, M 41-01
 2. Standard Specifications for Road, Bridge and Municipal Construction, M 41-10
 3. Materials Manual, M 46-01

1.04 SUBMITTALS

- A. A separate job mix formula for each proposed mix design shall be submitted in writing by the Contractor. Submittals shall represent all submittal elements specified herein and shall include as a minimum:
1. Mix designation/identification number and certificate of manufacturer's rated production rate.
 2. Plant where mix will be produced.
 3. Performance Graded Binder Certified Test Reports

- a. Source location and type of binder.
 - b. Certificate of Compliance, including date and signature of the supplier, regarding conformance with AASHTO M 320, Table 1.
 - c. Elastic recovery requirements in accordance with WSDOT Section 9-02.1(4)
 - d. Temperature-viscosity relationship of the asphalt cement.
 - e. Minimum mixing temperature (degrees F).
 - f. Minimum compaction temperature (degrees F).
4. Coarse Aggregate Certified Test Reports:
 - a. Source location and type of aggregate.
 - b. Angularity.
 - c. Bulk specific gravity.
 - d. Flat and elongated particles.
 - e. Soundness.
 - f. LA Abrasion.
5. Fine Aggregate Certified Test Reports:
 - a. Source location and type of aggregate.
 - b. Bulk specific gravity.
 - c. Percent natural sand (if used).
 - d. Sand equivalent.
 - e. Uncompacted void content.
6. Recycled Asphalt Pavement Test Reports (if used)
7. Anti-strip agent:

- a. Certification.
- b. Amount used.
- 8. Optimum Asphalt Determination (in accordance with ASTM D 5581 or ASTM D 6927, as appropriate).
 - a. Compactive effort (75 or 112 blows applied to specimen, each face, as appropriate).
 - b. Actual specific gravity and unit weight of each specimen.
 - c. Percentage of asphalt in each specimen.
 - d. Theoretical specific gravity of each specimen calculated.
- 9. Percentage and grade of performance graded asphalt binder.
- 10. Proportions and percentage of each aggregate stockpile.
- 11. Temperature of mix when discharged from the mixer.
- 12. Compaction temperature
- 13. Plot of the blended aggregate gradation and gradation control points on the Federal Highway Administration (FHWA) 0.45 power gradation curve.
- 14. Maximum specific gravity at the target binder content.
- 15. Gyratory compaction curve for Nmax.
- 16. Bulk specific gravity at Ndesign gyrations.
- 17. Percent theoretical maximum density at Ninitial, Ndesign, and Nmax gyrations.
- 18. Voids in mineral aggregate at Ndesign gyrations.
- 19. Voids filled with asphalt at Ndesign gyrations.
- 20. Dust to binder ratio
- 21. Flow value

- 22. Stability
 - 23. Actual unit weight of laboratory compacted mixture.
 - 24. Graphical plots of air voids, voids in the mineral aggregate, voids filled with asphalt, fines to effective binder content ratio, and unit weight verses asphalt content. Plots shall indicate values at -0.5 percent design asphalt content, design asphalt content, and +0.5 percent design asphalt content.
 - 25. Tensile strength ratio (TSR), strength of conditioned samples, and worksheets.
- B. The certification(s) shall show the appropriate AASHTO/ASTM test(s) for each material, test results, and a statement that the material meets the specification requirement.
- C. If requested by the Engineer, submit samples for each type of aggregate to be used and from each source with proper identification as to source, type of aggregate and contract number. Take all samples in accordance with requirements of ASTM D75 and D242. Submit in clean, sturdy bags and in the following amounts for each sample when requested:

MATERIAL	SAMPLE SIZE
Coarse Aggregate	25 lbs.
Fine Aggregate	25 lbs.
Mineral Filler	5 lbs.

- D. The job mix formula for each mixture shall be in effect until modified in writing by the Engineer. Should a change in mix or sources of materials be made, a new job mix formula must be tested and resubmitted for approved by the Engineer before the new mix is used.
- E. Working Drawings: For each paving area, provide working drawings to show the following information:
- 1. Direction of paving.
 - 2. Lane widths.

- 3. Thickness of each lift.
- F. Submit smoothness measurements and surface grade survey results to the Engineer prior to application for payment.
- G. Equipment List: The Contractor shall submit a list of equipment to be used for placing asphalt concrete to the Engineer prior to utilization on the job.
- H. Moisture content of asphalt.
- I. Flangeway detail. Shop drawing detailing method of providing flange way block out in asphalt placed around the rail. Plan to be approved by the Engineer before paving around rail begins.

1.05 CONTRACTOR QUALITY CONTROL

- A. The Contractor shall be responsible for developing the asphalt mix designs specified herein. The mix designs shall be developed and/or certified by a laboratory accredited by AASHTO under the AASHTO resource program. Mixtures on WSDOT's QPL are considered to be certified.
- B. Quality Control Testing: The Contractor shall conduct any and all quality control (QC) testing that he deems necessary to properly control the quality, consistency, and uniformity of the asphalt concrete mix being produced. No minimum number of quality control tests is required for this Contract.
- C. For all Quality Control testing performed by Contractor, information and data determined through that testing shall be made available for inspection by Engineer upon request. In no case, however, will Contractor's Quality Control test data be used by Engineer for acceptance or payment purposes.
- D. If the Contractor chooses to conduct quality control tests, the information and data determined through that testing shall be made available for inspection by the Engineer. In no case, however, shall the Contractor's quality control test data be used by the Engineer for acceptance or payment purposes.
- E. Surface Grades: Grades shall conform to the tolerance requirements specified herein, except where closer tolerance is required for the proper functioning of appurtenant structures and drainage as determined by the Engineer.

1.06 QUALITY ASSURANCE

- A. The Engineer will provide inspection services. Sampling and testing for compliance shall be in accordance with the applicable reference standards using certified technicians and accredited independent testing laboratories.

- B. Sampling and testing for compliance with the Contract provisions shall be in accordance with Section 01 33 00 - Submittal Procedures and Section 01 45 00 - Quality Control.
- C. The Contractor may obtain copies of results of tests performed by the Engineer, at no cost. Tests conducted for the sole benefit of the Contractor, shall be at the Contractor's expense.
- D. Unless otherwise referenced or modified herein, quality control and quality standards for this section shall be as specified in the WSDOT Standard Specifications.

1.07 JOB CONDITIONS

A. Environmental Requirements:

- 1. Do not place asphalt beginning October 1st through March 31st of the following year, without written concurrence from the Engineer.
 - 2. In case of sudden rain, the Engineer may permit placing of mixture then in transport from the plant provided that the surface upon which the mix is dry. In addition, the laydown temperatures must conform to the above requirements. Such permission, however, shall not be interpreted as a waiver of any of the quality requirements.
- B. New and existing manholes, catch basins, and utility vault covers shall be adjusted to conform to the new pavement grades. All lids, vaults, frames, grates, and other appurtenances shall be set to final grade and accepted by the Engineer paving. Paving shall be finished 1/4-inch to 1/2-inch higher than adjacent structures, unless otherwise shown or specified.
 - C. Existing Underground Utilities: The Contractor shall locate existing underground utilities in the area of the work. Those utilities which are to remain shall be adequately protected from damage.
 - D. All permanent utilities shall be installed prior to final paving. All utility trenches shall be patched with asphalt pavement as shown on the Contract Drawings.
 - E. Dust Control: The Contractor shall be responsible for dust control at the site. As a minimum, a water truck and vacuum truck shall be used on site for dust control when required by the Engineer.

PART 2 - PRODUCTS

2.01 PERFORMANCE GRADED ASPHALT BINDER (PGAB)

- A. Asphalt shall conform to the requirements of AASHTO M 320 and the elastic recovery requirements of WSDOT Standard Specification Section 9-02.1(4) for the Performance Grade specified herein.

2.02 AGGREGATE

- A. Coarse Aggregate – Coarse aggregate shall conform to WSDOT Standard Specification Sections 9-03.8(1), 9-03.8(2), 9-03.8(3), and 9-03.8(6), and AASHTO M 323, as modified below:

Test	Specification
Flat and Elongated Particles (ASTM D 4791, using a ratio of 5:1, maximum to minimum dimension)	8%, maximum
Coarse Aggregate Angularity (AASHTO T 335)	95% with 2 or more fractured faces, 100% with 1 or more fractured faces
LA Abrasion Wear (AASHTO T 96, 500 revolutions)	40% Maximum

- B. Fine Aggregate - Fine aggregate shall consist of clean, sound, durable, angular shaped particles produced by crushing stone or gravel that meets the requirements for wear and soundness specified for coarse aggregate. Natural (non-manufactured) siliceous sand may be used to obtain the gradation of the aggregate blend or to improve the workability of the mix. The amount of sand to be added will be adjusted to produce mixtures conforming to requirements of this Specification. The aggregate particles shall be free from coatings of clay, silt, or other objectionable matter and shall contain no clay balls. Fine aggregate shall conform to WSDOT Standard Specification Sections 9-03.8(1), 9-03.8(2), 9-03.8(3), and 9-03.8(6), and AASHTO M 323, as modified below:

Test	Specification
Sand Equivalent (AASHTO T 176)	45%, minimum

Uncompacted Void Content (AASHTO T 304, Method A)	45%, minimum
Deleterious Materials (AASHTO T 112)	2%, maximum

C. Mineral filler, when used, shall conform to the requirements of AASHTO M 17.

D. Crushed slag aggregates shall not be used.

E. Recycled Asphalt Pavement (RAP)

1. RAP, if used, shall conform to the requirements of WSDOT Standard Specification Section 9-03.8(3)B, 9-03.21(1), and 9-03.21(1)A, as modified herein.
2. The maximum proportion of RAP permitted within each mix shall not exceed 20 percent measured by total weight of HMA.
3. RAP shall have 100 percent passing the 2-inch sieve, 95 percent passing the 1 inch sieve, and shall be a mixture of only coarse aggregate, fine aggregate, and asphalt cement, free of solvents and other contaminating materials.
4. When RAP is used in a mixture, the RAP aggregate shall be extracted from the RAP using a solvent extraction (AASHTO T164) or ignition oven (AASHTO T308). The RAP aggregate shall be included in determinations of gradation, coarse aggregate angularity, fine aggregate angularity, and flat-and-elongated requirements. The sand equivalent requirements shall be waived for the RAP aggregates but shall apply to the remainder of the aggregate blend.
5. Documentation of RAP stockpile quality and traceability shall be submitted to the Engineer for approval prior to use.

F. Aggregate Gradation

1. Each gradation contains maximum and minimum control points. Job mix formula gradations must fall within control points for the specified nominal aggregate size. The combined aggregate shall conform to the gradation requirements shown below when tested in accordance with AASHTO T11 and T27. Design gradation requirements are as follows:

Sieve Size	1/2-inch NMAS
	(Percent Passing)
1-1/2"	-
1"	-
3/4"	100
1/2"	90-100
3/8"	75-90
No. 4	46-66
No. 8	33-45
No. 30	13-29
No. 200	3.0-7.0

2. Aggregates shall be provided in sufficient sizes to produce a uniform mixture. The Contractor shall indicate on the proposed job-mix formula the separate size designations of aggregate to be used.
3. It is recommended that the Bailey Method of gradation evaluation be used to evaluate the packing of aggregate particles and constructability of the blended aggregate mix. If segregation or non-uniformity is evident in the finished pavement, the Engineer reserves the right to require the Contractor to discontinue the use of crusher run or aggregate blends and to furnish separate sizes of open graded aggregate material.
4. Blended Aggregates:
 - a. Fine aggregates and coarse aggregates when blended shall not contain more than 2 percent by mass, clay and other friable particles as determined by AASHTO T 112.

- b. Each gradation contains maximum and minimum control points. Job mix formula gradations must fall within control points for the specified mix. The combined aggregate shall conform to the gradation requirements shown here when tested in accordance with AASHTO C117 and C136.

2.03 HOT MIX ASPHALT (HMA) MIX DESIGN

- A. Mix design shall be prepared by the Contractor in accordance with WSDOT SOP 732 as modified herein.
- B. Asphalt Binder: PG 70-22.
- C. Aggregate Gradation: 1/2-inch
- D. Gyration levels for mix preparation shall conform to the following:

Mix Designation	Ninitial	Ndesign	Nmax
½ inch	7	75	115

- E. The target air voids (Va) of the mix design at the design number of gyrations shall be as follows:

Mix Designation	Air Voids (Percent)
½ inch	4.0

- F. The voids filled with asphalt (VFA) at the target air void level shall be as follows:

Mix Designation	Voids Filled with Asphalt (Percent)
½ inch	65-75

G. The voids in mineral aggregate (VMA) of the HMA design shall be as follows:

Mix Designation	Voids Filled with Mineral Aggregate (Percent) Minimum ¹
½ inch	14.0

¹Note: VMA is not allowed to drop below minimum in production.

H. The HMA design when compacted in accordance with AASHTO T 312, shall meet the density specified below at the initial, design, and maximum compaction levels.

Compaction Level (Number of Gyration(s))	Required Density (% of Theoretical Maximum Specific Gravity)
N _{ini}	%G _{mm} ≤ 89
N _{des}	%G _{mm} = 96
N _{max}	%G _{mm} ≤ 98

I. The dust to binder ratio (by weight ratio between the minus 200 sieve material and effective asphalt content) of the blended mix shall be between 0.6 and 1.4 for 1/2-inch mix.

J. Compacted mix design shall have a tensile strength ratio (TSR) greater than or equal to 85 percent when tested in accordance with WSDOT Test Method T718, including the optional freeze-thaw cycle. In addition, the mixture shall have a minimum wet tensile strength of 80 pounds per square inch (psi) and a maximum dry tensile strength of 175 psi. In the event the mix design does not meet the tensile strength requirements the Contractor shall increase the approved anti-stripping agent dosage or take other corrective action to satisfy the specification.

2.04 HEAT-STABLE ANTI-STRIPPING ADDITIVE

A. Mix designs shall include a minimum of 0.1 percent by weight of binder, anti-stripping additive conforming to the requirements of WSDOT Standard Specification Section 9-02.4.

2.05 TACKCOAT

- A. Unless otherwise approved by the Engineer, the tack coat shall be CSS-1, CSS-1h, or STE-1 emulsified asphalt conforming to WSDOT Standard Specification Section 9-02.1(6). The CSS-1 and CSS-1h emulsified asphalt may be diluted with water at a rate not to exceed one part water to one part emulsified asphalt. The tack coat shall not exceed the maximum temperature recommended by the emulsified asphalt manufacturer.

2.06 JOINT AND CRACK SEALANT

- A. Sealant material shall conform to the requirements of WSDOT Standard Specification Section 9-04.2(1)A2.

PART 3 - EXECUTION

3.01 CONSTRUCTION METHODS

- A. Asphalt Mixing Plant – Asphalt shall be produced at a plant approved by the WSDOT. Plants shall conform to WSDOT Standard Specifications Section 5-04.3(3)A.
- B. Hauling Equipment:
 - 1. Hauling equipment shall conform to WSDOT Standard Specifications Section 5-04.3(3)B, as modified herein.
 - 2. Trucks shall be equipped with tarps, in good condition without holes, which can be tied down over the sides and ends of the truck beds during periods of inclement weather to prevent rain from entering the truck bed and coming in contact with the asphalt concrete mix.
 - 3. Trucks shall be loaded using a multiple-drop method (front then back the middle) to minimize truck to truck segregation.
- C. Paving Equipment – Asphalt pavers shall conform to WSDOT Standard Specifications Section 5-04.3(3)C.
- D. Materials Transfer Vehicle – The Contractor shall use a Materials Transfer Vehicle (MTV) to deliver the HMA from the hauling equipment to the paving equipment for any lift in or partially in the top 0.3 feet of the pavement section. MTVs shall conform to WSDOT Standard Specifications Section 5-04.3(3)D.

E. Compaction Equipment – Operate rollers in accordance with the manufacturer's recommendations. Do not use rollers that crush aggregate, produce pickup or washboard, unevenly compact surface, displace the mix, or produce other undesirable results.

F. Preparation of the Asphalt Binder Material (asphalt cement):

1. The binder shall be stored within the temperature range specified by the supplier of the binder for the grade of asphalt cement being used. Different grades of asphalt binder shall be stored separately and not mixed together at any time.
2. The binder shall be heated in a manner that will avoid local overheating and provide a continuous supply of the bituminous material to the mixer at a uniform temperature.
3. The temperature of the binder delivered to the mixer shall be sufficient to provide a suitable viscosity for adequate coating of the aggregate particles, but shall not exceed 350 degrees F unless otherwise required by the asphalt binder manufacturer.

G. Preparation of the Aggregates:

1. The aggregate for the mixture shall be heated and dried prior to introduction into the mixer. Aggregate shall be dry with no moisture content prior to introduction into the mixer. The maximum temperature and rate of heating shall be such that no damage occurs to the aggregates.
2. The aggregate temperature shall not be lower than is required to obtain complete coating and uniform distribution of the aggregate particles and to provide a mixture of satisfactory workability.

H. Preparation of Bituminous Mixture:

1. Asphalt plant shall not exceed production rate certified by manufacturer.
2. Mixing shall conform to WSDOT Standard Specifications Section 5-04.3(6), as modified herein.
3. The aggregates and the bituminous material shall be properly proportioned and introduced into the mixer in the amount specified by the job mix formula.

4. Job mix formula production tolerances shall conform to WSDOT Standard Specifications Section 9-03.8(7), except the tolerance limits for aggregate shall not exceed the limits of the control points specified herein.
5. The moisture content of all bituminous mix upon discharge shall not exceed one (1) percent. Asphalt sampling shall be performed in accordance with AASHTO T 168 and moisture content testing shall be performed in accordance with AASHTO T 329. Results of the moisture content testing shall be submitted to the Engineer.

I. Preparation of the Underlying Surface:

1. Preparation shall conform to WSDOT Standard Specifications Sections 5-04.3(4), and, 5-04.3(4)C as modified herein.
2. Asphalt materials shall not be placed until the underlying course has been tested and accepted by the Engineer.
3. The underlying surface shall be free of water, foreign material, and dust when the hot mix asphalt mixture is applied. Immediately before placing asphalt materials, clean all underlying surfaces and previous courses of all loose and foreign material by sweeping with hand brooms, power sweepers or blowers as directed by the Engineer.
4. Tack Coat:
 - a. Tack coat shall be applied in accordance with WSDOT Standard Specifications Section 5-04.3(4), as modified herein. The Engineer shall verify that the tack coat has been properly placed prior to constructing subsequent pavement lifts. Refer to the applicable sections in Chapter 5 of the WSDOT Construction Manual for guidance on tack coat application and inspection.
 - b. Apply tack coat only when the underlying surface is free of water, foreign material, dust, and the ambient temperature meets the requirements for the pavement course being placed.
 - c. Residual asphalt coating shall be 0.03 to 0.05 gallons per square yard on newly placed asphalt surfaces
 - d. Residual asphalt coating shall be 0.06 to 0.08 gallons per square yard on existing or milled asphalt surfaces.
 - e. Residual asphalt coating shall be 0.06 to 0.08 gallons per square yard on compacted subgrade.

- f. Tack coat shall be applied to all vertical surfaces of existing pavement, curbs, gutters, utility structures, concrete edge of the wharf, and construction joints in the asphalt against which additional material is to be placed.
 - g. Exposed surfaces of utility vault lids, frames, grates, valve boxes, inlets and other appurtenances within the area to be paved shall be protected from tack coating.
5. Manholes, valve boxes, inlets, frames, grates, lids, and other appurtenances within the area to be paved shall be adjusted to final grade as shown on the Contract Drawings, shall be in place during paving operations, and shall not be paved over as part of the paving operation. Permanent curbs, gutters, and other supports shall be constructed and backfilled prior to placing asphalt. All contact surfaces shall be coated with tack coat.

J. Transporting, Placing, and Finishing:

- 1. The asphalt concrete mixture shall be transported from the mixing plant to the site in vehicles conforming to the requirements specified herein.
- 2. Hauling over freshly placed material shall be not permitted until the material has been compacted, as specified, and allowed to cool to atmospheric temperature.
- 3. Placing and finishing of the asphalt mixture shall be in accordance with WSDOT Standard Specifications Section 5-04.3(7), as modified herein.
- 4. The nominal compacted depth of any layer of any course shall not exceed five (5) times the nominal maximum aggregate size of the asphalt mix.
- 5. The hot mix asphalt mixture shall not be placed during unsuitable weather or when the surface temperature of the underlying course is less than that specified below. Asphalt shall not be placed unless the atmospheric temperature is at least 50 degrees F and rising. The temperature requirements may be waived by the Engineer, if requested; however, all other requirements including compaction shall be met.

Lift Thickness, T (inches)	Minimum Base Temperature (degrees F)
$T > 3$	40
$2 < T < 3$	45

T<2	55
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6. The initial placement of the asphalt concrete mixture shall occur at a temperature suitable for obtaining density, surface smoothness, and other specified requirements but not less than 250 degrees F, unless approved by the Engineer.
7. Upon arrival, the mixture shall be placed to the full width of the paving lane. It shall be struck off in a uniform layer of such depth that, when the mix is properly compacted, shall have the required thickness and conform to the grade and contour indicated. The speed of the paver shall be regulated to eliminate pulling and tearing of the bituminous mat. Unless otherwise permitted, placement of the mixtures shall begin along the centerline of a crowned section or on the high side or areas with a one-way slope. The mixture shall be placed in consecutive adjacent strips having a minimum width of 10-feet except where edge lanes require less width to complete the area.
 - a. For density determination, each day's production will be treated as a lot. A minimum of ten sublots will be tested each day; 15 if production tonnage is expected to exceed 600 tons for that day. In no case shall the subplot size for density determination exceed 40 tons. Random test locations will be determined according to WSDOT Test Method T 716.
 - b. In-place density shall be a minimum of 93% of the reference theoretical maximum density as determined by WSDOT FOP for WAQTC TM 8. Evidence of gauge calibration to cores, required in the test method, shall be provided for the approved job-mix being placed at a similar thickness or the gauge will be calibrated as described in the test method.
 - c. Determine reference theoretical maximum density as the moving average of the most recent five determinations for the lot of asphalt concrete being placed according to WSDOT Materials Manual Standard Operating Procedure 729.
 - d. Engineer may evaluate cyclic density as described in WSDOT Standard Specifications Section 5-04.3(10)B2 to assess segregation.
8. Joints:
 - a. The longitudinal joint in one course shall offset the longitudinal joint in the course immediately below by at least 6-inches; however, the joint in the surface course shall be at the centerline of the pavement if that pavement is to be used by normal car or truck traffic.

- b. Longitudinal joint density shall be assessed once per subplot in accordance with WSDOT SOP 735. Low density is defined as less than 91 percent of reference maximum density. When placing a single paver width patch, consecutive density tests will be taken on alternating sides of the patch.
 - c. Transverse joints in one course shall be offset by at least 10-feet longitudinally from transverse joints in the previous course. Transverse joints in adjacent lanes shall be offset a minimum of 10-feet.
- 9. On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the mixture may be spread and raked by hand tools.
- 10. Formation of all joints shall be made to ensure a continuous bond between courses and obtain required density. Joints shall have same texture as other sections of course and meet requirements for smoothness and grade.
- 11. Roller shall not pass over unprotected transverse end of freshly laid mixture except when necessary to form a temporary stop. After a temporary stop, and prior to continuation of paving, the tapered edge shall be cut back to its full depth and width on a straight line, to expose a vertical face, before placing the adjacent lane.
- 12. Longitudinal joints which are irregular, damaged, uncompacted, or otherwise defective shall be cut back to expose a clean, vertical, sound, surface for the full depth of the course. Apply tack coat on all newly exposed contact surfaces before placing any fresh mixture against the joint.

3.02 COMPACTION OF MIXTURE

- A. After placing, the mixture shall be thoroughly and uniformly compacted by rolling. Surface shall be compacted as soon as possible when the mixture has attained sufficient stability so that the rolling does not cause undue displacement, cracking or shoving. Sequence of rolling operations and the type of rollers shall be at the discretion of the Contractor.
- B. Compaction shall be completed before the mixture cools below 175 degrees F, unless otherwise approved by the Engineer. Temperature shall be determined using an infrared thermometer by the Engineer.
- C. The speed of the roller shall, at all times, be sufficiently slow to avoid displacement of the hot mixture and be effective in compaction. Any displacement occurring as a result of reversing the direction of the roller, or from any other cause, shall be corrected at once.

- D. In areas not accessible to the roller, the mixture shall be thoroughly compacted with mechanical tampers.
- E. Any mixture that becomes loose and broken, mixed with dirt, contains check-cracking, or in any way defective shall be removed and replaced with fresh hot mixture and immediately compacted to conform to the surrounding area. This work shall be done at Contractor's expense. Skin patching will not be allowed.
- F. Compaction of the asphalt mixture shall be in accordance with WSDOT Standard Specifications Section 5-04.3(10), as modified herein.
 - 1. For density determination, each day's production will be treated as a lot. A minimum of ten sublots will be tested each day; 15 if production tonnage is expected to exceed 600 tons for that day. In no case shall the subplot size for density determination exceed 40 tons. Random test locations will be determined according to WSDOT Test Method T 716.
 - 2. In-place density shall be a minimum of 93% of the reference theoretical maximum density as determined by WSDOT FOP for AASHTO T209. A minimum of two cores per day/lot will be taken by the Contracting Agency or their representative to confirm gauge calibration. At the Contracting Agencies discretion, cores can be used as the sole means of density acceptance with a testing frequency meeting the of Section F(1).
 - 3. Determine reference theoretical maximum density as the moving average of the most recent five determinations for the lot of asphalt concrete being placed according to WSDOT Materials Manual Standard Operating Procedure 729.
 - 4. Engineer may evaluate cyclic density as described in WSDOT Standard Specifications Section 5-04.3(10)B to assess segregation.

3.03 JOINT SEALANT

- A. Apply joint sealant to the edges of new paving joints, catch basins, manholes, at the meet lines to concrete structures and as directed by the Engineer.

3.04 SURFACE SMOOTHNESS

- A. The completed surface of the wearing course shall conform to the smoothness tolerance requirements of WSDOT Standard Specifications Section 5-04.3(13).

3.05 FIELD QUALITY CONTROL

- A. Contractor shall backfill core holes with quickset concrete with a minimum compressive strength of 3,000 psi.
- B. Surface Grades: Grades shall conform to tolerance requirements specified herein, except where a closer tolerance is required for the proper functioning of appurtenant structures and drainage as determined by Engineer.
- C. After the curing, Contractor shall perform a flood test to check if there are any local depressions on the pavement. All asphalt pavement work where water ponds and does not run off within a reasonable amount of time, as determined by the Engineer, shall be fixed to provide proper drainage. Test shall be performed in the Engineer's presence.
- D. Quality Assurance Testing By Engineer:
 - 1. Contractor shall arrange for Engineer to have access to the mixing plant for verification of weights or proportions, character of materials used and determination of temperatures used in the preparation of asphalt concrete mix.
 - 2. Contractor shall provide reasonably safe and convenient access, acceptable to Engineer, for inspection and sampling of the AC, and shall cooperate in the inspection and sampling process when requested to do so.

3.06 ADJUSTING AND CLEANING

- A. The Contractor shall adjust manholes, utility vaults and boxes, and valve boxes to final grades.
- B. At the conclusion of the work and before final payment is made, Contractor shall remove all debris of every kind from the premises and leave the area broom clean.

3.07 PROTECTION

- A. After final rolling, the Contractor shall not permit vehicular traffic on pavement for a minimum of 24 hours until it has cooled and hardened.
- B. The Contractor shall erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

The work includes the requirements for providing and installing traffic lane and auto storage area striping and pavement markings as indicated on the Drawings. This work includes all labor, materials, and equipment to fabricate and install signs indicated on the Drawings.

1.02 QUALITY ASSURANCE

Employ at least one person who shall be present at all times during execution of this portion of the work, shall be thoroughly familiar with the type of materials being installed and the best methods for their installation and shall direct all work performed under this section.

1.03 SUBMITTALS

Submit in accordance with Section 01 33 00 – “Submittal Procedures”, the following:

- A. Manufacturer’s current technical specifications and installation instructions.
- B. Material certificates signed by material supplier and Contractor, certifying that each material item complies with or exceeds specified reference standards.

PART 2 - PRODUCTS

2.01 PAVEMENT MARKING PAINT

Pavement marking paint shall be no heat, low VOC waterborne paint, top dressed with glass beads. Pavement marking paint color shall be white or as depicted on the Plans. Paint shall not be used if there is evidence of heavy caking or settling in the original container or if the paint has been stored for more than one year from the date of manufacture.

2.02 SIGNING

Signing materials and fabrication shall be completed according to the Washington State Department of Transportation (WSDOT) Standard Specification, 2018 Edition, Section 9-28 Signing Materials and Fabrication. The sign shall be a sheet aluminum sign conforming to WSDOT Standard Specification 9-28.8, and hardware per Standard Specification 9-28.11, and reflective sheeting per Standard Specification 9-28.12 and timber sign posts shall be constructed per Drawings and WSDOT Standard Specification 9-28.14(1).

Signs located in the City of Tacoma right-of-way signs shall comply with the Manual on Uniform Traffic Control Devices, 2009 Edition.

PART 3 - EXECUTION

3.01 GENERAL

Install parking striping, lane striping, no driving area striping, traffic letters, pavement markings and signage as indicated on the Drawings and as directed by the Engineer.

3.02 SURFACE PREPARATION

Sweep and clean surface to eliminate loose material and dust. All contaminants within the areas to receive pavement markings shall be removed. Large areas of tar, grease or foreign materials may require sandblasting, steam cleaning or power brooming to accomplish complete removal.

3.03 PAINT APPLICATION

Apply paint in two coats with mechanical equipment to produce uniform straight edges. All materials shall be applied in accordance with Washington State Department of Transportation Standard Specifications, 2018 Edition, Section 8-22.3. A manufacturer's representative shall be present to approve installation procedures and conditions of surface prior to application.

3.04 GLASS BEADS

All paint markings shall be top dressed with beads. The application rate on painted markings shall be seven pounds of beads per gallon of paint. The bead application system shall provide a uniform bead distribution over the entire surface of the marking. Beads shall be applied to paint markings at the same time the paint is applied to the roadway and shall be dispensed by a pressurized bead gun system.

3.05 SIGNING

All permanent signing located within 30 feet from edge of the lane shall be turned out approximately three degrees from the pavement edge of oncoming traffic lanes. All sign post shall be plumb and signs level.

END OF SECTION

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

The extent and location of "fence" work is indicated on the drawings. The work includes the requirements for furnishing and installing all items and components of a completed fence system in conformance with these specifications and the dimensions and sections indicated on the drawings or as established by the Engineer.

1.02 SUBMITTALS

- A. Submit supplier's certificate certifying that products meet or exceed specified requirements.
- B. The Contractor shall submit shop drawings of fencing, gates and appurtenances. Shop drawings must be approved by the Engineer prior to fabrication or installation.

1.03 SITE CONDITIONS

- A. Clearing of the fence line will be required. Clearing shall consist of the removal and disposal of all vegetation measuring more than one inch in diameter or higher than 15 inches above the ground. The clearing width shall be approximately ten feet for chain-link-type fences and approximately three feet for wire-type fences.
- B. Grading of the fence line shall be accomplished to eliminate abrupt changes in ground contours. Grubbing incidental to grading shall be accomplished as required. Vegetation resulting from grubbing activities shall be disposed of as cleared material. Boulders, rocks, or excess excavation shall be graded along the fence line or placed adjacent to the clearing on Port property as directed by the Engineer.

PART 2 – PRODUCTS

2.01 CHAIN LINK FENCE

The fence shall be chain link fabric supported on a steel frame, the posts of which are embedded in concrete foundations. Barbed wire supported on brackets above the fabric portion shall be installed as indicated on the drawings. Materials shall be polymer coated heavy industrial chain link fencing in accordance with ASTM F1043, with the additional requirements as follows:

- A. General: All steel fabric, framework and fittings shall be hot-dipped galvanized and black polymer coated in accordance with the applicable ASTM specification.
- B. Fabric: Fence fabric height shall match existing and shall be black PVC or polyolefin elastomer coated, 7 mil to 15 mil thickness, thermally fused to zinc-coated steel core wire per ASTM F668 Class 2b, and the wire shall be No. 9 gage and the fabric shall be twisted and barbed on both selvages.
- C. Framework:
 - 1. Posts, rails and braces shall be in accordance with ASTM F1043, hot dip galvanized with minimum average 1.8 oz zinc coverage per square foot of coated surface area, with black PVC-coated finish of 10 to 15 mils, thermally fused.

- a. Line posts shall be 2.375-inch O.D., Schedule 40 pipe @ 3.65 pounds per foot, or "C" section @ 2.10 pounds per foot.
- b. End, corner, or pull posts shall be 2.875-inch O.D., Schedule 40 pipe @ 5.79 pounds per foot.
- c. Swing gate posts shall be sized according to the following tabulation. Pipe sizes are nominal O.D. for Schedule 40 pipe.

<u>Swing Gate Opening (2-in.Frames)</u>	<u>Gate Post</u>	<u>Weight, Pounds per Linear Ft</u>
Single Pedestrian (6 ft max)	2-7/8 in. O.D.	5.79
Single 20 ft. and over	8-5/8 in. O.D.	24.70

- d. Top rails and post braces shall be 1.66-inch O.D., schedule 40 pipe @ 2.27 pounds per foot, or Type II "C" section as detailed on the drawings @ 1.35 pounds per foot.
2. Tension Wire shall be No. 7 gage, coil spring, high tensile strength wire, Marcellled, and coated with not less than 0.80 oz. of zinc per square foot of uncoated wire surface and coated with thermally-fused black PVC or polyolefin elastomer in accordance with ASTM F1665.
3. Ties shall be No. 9 guage thermally fused black polymer coated galvanized steel meeting the requirements of ASTM F626.
- D. Fittings: All fittings, accessories and hardware for Class 2b thermally fused black polymer coated galvanized chain link fence shall conform to the requirements of ASTM Designation F626 and other ASTM Designations listed therein.
- E. Gates

1. Chain link gates shall be constructed with chain link fabric fastened to the end bars of the gate frame by tension bars and fabric bands, and to the top and bottom bars of the gate frames by tie wires in the same manner as specified for the chain link fence fabric.
2. Gate frames shall be constructed in accordance with ASTM F-900. The corners of the gate frame shall be welded and coated with two coats of GALVACON or approved equal and two coats of manufacturer approved black polymer coating.

Cross-trussing shall be 3/8-inch galvanized steel adjustable rods, galvanize and having class 2b thermally fused black PVC or polyolefin elastomer coating.

Each gate shall be provided complete with necessary hinges, gate keeper for each swing leaf, latch and drop bar locking device designed for the type of gate, posts and lock used.

Gates shall have positive-type latching devices with provisions for padlocking. Padlocks will be furnished by the Port of Tacoma.

F. Other Materials

1. Barbed Wire: Perimeter (Coast Guard) Fences: Each barbed wire shall conform to the requirements of ASTM F1665 and shall consist of two strands of 12-1/2-gauge having 0.007-inch minimum of class 2b thermally fused black polymer coating over 0.3-oz. of zinc coating per square foot of wire, twisted with 4-point, 14-gage barbs with the barbs spaced no more than five inches apart.
2. Concrete used in anchorage of posts shall be shall be Class B as specified in Section 03 30 00 – Cast-in-Place Concrete.
3. Barbed wire supporting arms (Coast Guard Perimeter Fences): Shall be black PVC-coated, minimum thickness of 0.006 inch, maximum thickness of 0.015 inch of the single, 45 degree outward angle 4-strand arm type and of the design required for the post furnished. Secure arms by top rail.

PART 3 – EXECUTION

3.01 GENERAL

- A. The location and alignment of the fence corners, angle points and gates is indicated on the Drawings. The Contractor shall locate all intermediate line posts.

3.02 INSTALLATION

- A. Fencing, gates and appurtenances shall be erected and installed by an organization regularly engaged in this business, employing labor skilled in this type of work to provide a complete security fencing system.
- B. Swing gates shall be fabricated to withstand wind and swing loads. They shall have locking bars to seat into keepers that are set in concrete in ground locations which will hold the gate rigidly in position when closed. Stops which will hold the gate open shall be provided and set in concrete at the location designated by the Engineer. Hinges shall be provided which will allow the gate to swing the entire arc indicated on the drawings. Install gates on gate posts only, do not install on buildings.
- C. Fabric shall be fastened to posts, the top rail and the bottom wire, with wire ties spaced as indicated on the drawings.
- D. Top rails shall be continuous. The Contractor shall provide for expansion or contraction of the continuous rail. Expansion and contraction spring couplings shall be installed at intervals of 100 feet maximum.
- E. Posts shall be installed vertically in the concrete with a minimum depth of embedment indicated on the drawings and at the spacing specified for the type of posts approved for the Project. In unpaved areas, the concrete shall be struck off two inches above the surrounding grade. In paved areas it shall be struck off flush with the paving. The top of the concrete shall be trowelled smooth, with a slight slope away from the posts.

- F. Minor damage to galvanizing of fabric and fence appurtenances shall be repaired by thorough cleaning of the damaged surfaces and the application of "GALVACON," or approved equal, in strict accordance with the manufacturer's recommendations.
- G. Upon completion of the fence, the Contractor shall clean the fence of all soiled places and repair marred or abraded areas.

END OF SECTION

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. The extent of Water Utilities work is indicated on the drawings. Work includes the requirements for providing the water system complete in place, including moving of an existing fire hydrant and placement of new piping and fittings, including excavation, bedding, backfill, compaction, installation of pipe sleeves, thrust blocking, fire hydrants and valves and valve boxes, ship service vaults, coordination with electrical work, etc., all in conformance with these specifications and the dimensions and sections indicated on the drawings or within the lines and grades established by the Engineer.

1.02 QUALITY ASSURANCE

- A. Qualification of Workers: Employ the services of a qualified utility contractor, who will be thoroughly familiar with the type of materials being installed and the best methods for their installation, and who shall direct all work performed under this section.
- B. Codes and Standards: Comply with the applicable provisions of all pertinent codes and regulations. References made herein for manufactured materials, such as pipe, fittings, valves, hydrants and specialties; refer to designations for American Water Works Association (AWWA), American National Standards Institute (ANSI) and to the latest edition of the Standard Specifications and Standard Plans for Road, Bridge, and Municipal Construction prepared jointly by the Washington State Department of Transportation (WSDOT) and the American Public Works Association (APWA).
- C. City of Tacoma: The Contractor shall coordinate with and comply with the applicable provisions of all pertinent local codes and regulations of Tacoma Public Utilities / Tacoma Water and City of Tacoma Fire Department (TFD) concerning testing, flushing, disinfection, installation, inspection and materials used. The Contractor shall also acquire a Commercial Fire Protection System permit from TFD prior to beginning work on any part of the fire water system.
- D. Tacoma Water facilities must remain accessible at all times. Any damage to Tacoma Water facilities occurring as a result of work performed by the Contractor shall be repaired by Tacoma Water at the expense of the Contractor.
- E. All work associated with installation of the underground fire water main and hydrants shall be performed by a contractor that is licensed by the Washington State Fire Marshal's Office as a Level U Fire Protection Sprinkler System Contractor.
- F. All water system components unless noted otherwise shall be rated for a working pressure of at least 125 psi and a testing pressure of 225 psi, meet current Safe Drinking Water Act lead free requirements and be approved for potable use by National Sanitation Foundation (NSF).

1.03 SUBMITTALS

Submit the following in accordance with Section 01 33 00 - Submittal Procedures for the following products:

- A. Piping, Fittings, Valves, Accessories
 - 1. Manufacturer's catalog cuts and shop drawings to demonstrate that all items conform to the specifications for the following:

- a. Pipe, fittings, couplings and accessories
- b. Valves
- c. Fire Hydrants
- d. Water vault backflow prevention assemblies
- e. Water vault water meters
- f. Water vault strainers
- g. Water vault pipe supports
- h. Blow-off assembly
- i. Expansion joints

The Contractor shall furnish manufacturer's installation and operations manuals, bulletins and spare parts lists for all items.

- B. Certificate of Competency from the Washington State Fire Marshal's Office for the Level U Fire Protection Sprinkler System Contractor that will be performing work associated with installation of the underground fire water system.

1.04 PRODUCT HANDLING

- A. Pipe shall be handled in conformance with section 7-09.3 (13) of the WSDOT Standard Specifications. Handle pipe to prevent damage to the pipe, pipe lining, or coating. Damage to the pipe, pipe lining, or coating, if any, shall be repaired as directed by the Engineer or replaced at the Contractor's expense.
- B. At times when pipe laying is not in progress, close the open ends of the pipe with a watertight plug or by other means approved by the Engineer to ensure cleanliness inside the pipe.

PART 2 – PRODUCTS

2.01 PIPE AND FITTINGS

- A. General: Materials shall be in accordance with the applicable references within WSDOT Standard Specifications, Section 7-09.2.
- B. Polyvinyl Chloride (PVC) Pipe and Fittings:
 - 1. Polyvinyl Chloride (PVC) Pipe, 4 inches and larger: PVC pipe for water distribution shall meet the requirements of AWWA C900 Class 200. PVC pipe shall have the same outside dimensions as ductile iron pipe. . Pipe shall be listed by underwriters laboratory.
 - 2. Polyvinyl Chloride (PVC) Pipe, small than 4 inches: PVC pipe for water distribution, 1.5 inch to 3 inch diameter, shall be IPS pressure PVC pipe meeting the requirements of ASTM D2241, SDR 21. PVC compounds used in the extrusion of this pipe shall meet the requirements of ASTM D1784 cell class 12454.
 - 3. PVC pipe shall be considered flexible conduit. Joints shall meet the requirements of ASTM D 3139 using a restrained rubber gasket conforming to ASTM F477. Pipe joints within 21 feet of a bend or tee fittings shall be furnished and installed with

pipe to pipe restraints meeting the requirements of UNI-B-13-94. Solvent weld pipe joints are not permitted.

4. Fittings for PVC pipe 3 inches and larger shall be ductile iron meeting the requirements of ANSI/AWWA C110 and shall be cement mortar lined in accordance with ANSI/AWWA C104 or C153. Joints for fittings shall be mechanical type or push-on type with restraining lugs or ears.
5. Fittings shall be equipped with joint restraints for the PVC pipe of the type being joined, C900 or IPS. The restraint shall be manufactured of ductile iron conforming to ASTM A536. A split serrated ring shall be used to grip the pipe in conjunction with a sufficient number of bolts connecting the serrated restraint to the joint. The combination shall have a pressure rating of at least 200 psi.
6. Manufactured joint restraints shall be per WSDOT Standard Specification Section 9-30.2(6) and be Ford, EBAA Iron, Romac Industries, Field Lock 350 by US Pipe, Flex-Ring by American Pipe or approved equal and shall be rated for 225 test pressure or better.

C. Copper Pipe and Fittings:

1. Copper pipe shall be annealed, seamless, and conform to the requirements of ASTM B88, Type K rating for both below ground pipe and for above ground pipe where specified on the plans.
2. Fittings shall be wrought copper, conforming to ASTM B 75 for materials and ANSI B16.22 for dimensions, or cast bronze, conforming with ASTM B 62 for materials and ANSI B16.18 for dimensions. Solder joints with 95/5 solder and NAPP gas.

D. High Density Polyethylene (HDPE) Water Service Pipe and Fittings:

1. HDPE water service pipe shall be manufactured from PE4710 resin conforming to ASTM D3350. Pipe shall be manufactured in accordance with AWWA C901 and shall be, pressure class 200 or greater, sized in accordance with IPS outside diameter sizes.

E. Ductile Iron (DI) Pipe and Fittings:

1. DI pipe shall be ductile iron cast in accordance with ANSI/AWWA C151/A21.51 and shall be cement mortar lined with asphaltic coating in accordance with ANSI/AWWA C104/A 21.4.
2. Flanges for DI pipe shall be ductile iron or gray iron conforming to the requirements and ANSI/AWWA C115/A 21.15.

2.02 ACCESSORIES

A. Service Saddle and Corporation Stop:

1. Water service saddle shall in accordance with WSDOT Standard Specifications, Section 9-30.6(1) and corporation stop shall be in accordance with WSDOT Standard Specifications, Section 9-30.6(2).
 2. Saddle shall be nylon coated with stainless steel straps, U-bolts and taper thread. Saddle shall be Romac Industries. Corporation stop shall be brass body conforming to AWWA C800, 300 psi working pressure as manufactured by the Ford Meter Box Company.
- B. Freeze Protection Valves:
1. As temperatures fall, a thermostatic element senses water temperature and the valve modulates open. A sample of the water in the line then flows past the element. If the water temperature is sufficiently high, the valve shuts off. If the water temperature is low the valve modulates as needed to promote flow.
 2. Valve is full open at 35 degrees F and below and valve will be fully closed at 40 degrees F. Stainless steel body, fittings, spring and plug. Corrosion resistant for long service life. Ram-type plug for reliable tight shutoff. Sensitive to temperature only and unaffected by pressure variations.
- C. Adapters, Couplings and Unions: Coupling adapters at tie-ins to existing pipes, if required, shall be Smith Blair or approved equal. Provide dielectric unions and couplings at connections between dissimilar materials.
- D. Heat Tracing:
1. Heat tracing in Hot Boxes: Self-regulating Low Temperature Cable for metallic pipe shall have a protective high temperature overjacket. Input shall be 120 volts, output 6 watts per foot of cable. Cable shall not be hard wired. Cable shall come with accessories, including but not limited to power connection boot, end termination boot, thermostat, mounting brackets and caution labels in full compliance with NEC. Heat tracing cable shall be 3M or as approved by the Engineer.

2.03 VALVES

A. Gate Valves 3 Inches & Larger

1. Type: Resilient seat valves, ANSI/AWWA C509, WSDOT Standard Specifications Section 9-30.3(1)
2. Rating: 200 psi
3. Opening: Counter clockwise
4. Body: Ductile iron epoxy coated
5. Ends: Flanged, mechanical joint
6. Stem: Non-rising high strength bronze
7. Stem seals: O-ring
8. Body-bonnet connections: Bolted with corrosion-resistant material.
9. Manual Operator: Hand wheel for valves in structures, 2-inch square operating nut for buried valve box installation

10. Manufacturer: M&H Valve Model C509/C515, Clow Valve Model 2639/2640, American Flow Control Series 2500, or approved equal.
- B. Gate Valves 2-1/2 Inches & Smaller: 1. MSS SP-80; Class 125, 200-psi cold working pressure (CWP), or Class 150, 300-psi CWP; ASTM B 62 cast-bronze body and bonnet, solid-bronze wedge, copper-silicon alloy rising stem, teflon-impregnated packing with bronze packing nut, threaded or soldered end connections; and with aluminum or malleable-iron hand wheel.
- C. Ball Valves:
 1. Size: Two (2) inches and smaller
 2. Material: Bronze
 3. Rating: 600 psi W.O.G.
 4. Ball and Stem: 316 Stainless steel
 5. Seats: reinforced Teflon
 6. Connection: Threaded
 7. Manufacturer: Watts, Series FBV-3, or approved equal.

2.04 BACKFLOW PREVENTION ASSEMBLIES

- A. 2-inch
 1. Type: Reduced Pressure Principle
 2. Design: Check valves shall be ductile iron and loaded to one psi in the direction of flow. A pressure differential relief valve shall be located between the two check valves.
 3. Accessories: Ball Valves and Test Cocks
 4. Working pressure: Max. 175 psi
 5. Hydrostatic Test Pressure: 350 psi
 6. Approvals: By State and Local Authorities
 7. Body: Bronze
 8. Ends: Threaded or Flanged, see Drawings
 9. Servicing: provide unions for removal or assembly outside of ball valves.
 10. Manufacturer: FEBCO Series 825Y, Watts LF909, or approved equal.
- B. 4-inch and Larger
 1. Type: Reduced Pressure Principle
 2. Design: Check valves shall be ductile iron and loaded to one psi in the direction of flow. A pressure differential relief valve shall be located between the two check valves.
 3. Accessories: Ball Valves and Test cocks

4. Working pressure: Max. 175 psi
 5. Hydrostatic Test Pressure: 350 psi
 6. Approvals: By State and Local Authorities
 7. Body: Bronze
 8. Ends: Flanged
 9. Manufacturer: Watts LF909 or approved equal.
- C. Hot Boxes: Hot Boxes shall be sectional aluminum enclosures certified to ASSE 1060 with removable doors and the capability to be completely removed for maintenance. Insulation shall be R10 and a minimum of 1 ½" thick, and be unicellular, non-wicking, polyisocyanate, sprayed in place to form a monolithic bond. Drains shall be sized for full port backflow discharge and designed to prohibit the intrusion of debris and/or vermin. Enclosure shall be anchored to a concrete slab from within the enclosure with steel anchors and shall be lockable. Hot Boxes shall be of the size indicated on the Drawings and shall be manufactured by Hot Box, Jacksonville, FL or approved equal.

2.05 FIRE HYDRANTS

- A. Type: Dry-Barrel Fire Hydrants, AWWA Standard C502.
- B. Manufacturer: Medallion by CLOW Valve Company
- C. Rating: Minimum working pressure of 250 psi
- D. The dimensions and details of hydrant and nozzles shall be as follows:
 1. Hydrant connection pipe size, inside diameter 6 inches
 2. Standpipe, minimum inside diameter.....7 inches
 3. Valve opening, minimum diameter.....5-1/4 inches
 4. Auxiliary gate valve.....6 inches
 5. Hose nozzle.....2 @ 2-1/2" NST
 6. Nozzle threads.....7-1/2 per inch
 7. Outside diameter finished nozzle.....3.0625 inches
 8. Diameter at root of thread.....2.8715 inches
 9. Thread pattern.....60° V thread
 10. Threaded length of male nipple.....1 inch
 11. "Steamer" nozzle Pacific Coast Pumper Thread.1@4inches
 12. "Steamer" nozzle threads.....6 per inch
 13. Outside diameter finished nozzle.....4.828 inches
 14. Diameter at root of thread.....4.580 inches
 15. Thread pattern.....P.C.P. std.
 16. Threaded length of male nipple.....P.C.P. std.
 17. Storz 5" Steamer Port Hydrant Adaptors with blind cap and cable.

- E. Painting: Below the ground use Coal Tar Epoxy in accordance with SSPC-Paint 16 and referenced standards, with a minimum dry film thickness of 70 mils. Above ground paint in accordance with AWWA C502 and Tacoma Fire Department Requirements.

2.07 VALVE BOX AND COVERS

- A. Valve Box shall be in accordance with WSDOT Section 9-30.3(4). Frame and Lid shall be tested for accuracy of fit. Castings and extensions shall be hot-dipped in asphaltic varnish Royston Roskote #612XM. Manufacturer: Olympic Foundry, or approved equal.

2.08 CONCRETE FOR THRUST BLOCKS, PADS AND COLLARS

- A. Concrete compressive strength shall be minimum 3,000 psi at 28 days and in conformance with the requirements of Section 03 30 00 – Cast-in-Place Concrete.

PART 3– EXECUTION

3.01 TRENCHING, BEDDING AND BACKFILL

- A. All earthwork related to water piping shall conform to the requirements of Section 31 00 00 – Earthwork, Section 31 23 33 - Trenching and Backfilling and Section 31 23 19 - Dewatering and the details and notes on the Drawings. Provide shoring as necessary to support existing items noted to remain in place.
- B. In the event that water is encountered or accumulates in the trench, it shall be removed during the pipe-laying operation and be maintained in a water-free condition until the ends of the pipe are sealed and provisions are made to prevent floating of the pipe. At no time allow trench water to enter the pipe.

3.02 COORDINATION WITH OTHERS

- A. Prior to starting work coordinate shut downs, demolition, testing, flushing, disinfection and reopening water supply with the Port, Tacoma Water, Tacoma Fire Department and others as required by permit.

3.03 HANDLING THE PIPE

- A. During installation, handle the pipe as specified in paragraph 1.05 above. Pipe that has become damaged or contaminated shall be removed from the trench, cleaned, and repaired as required and re-laid.

3.04 LAYING PIPE

- A. General: Construction shall conform to manufacturer instructions and requirements in accordance with WSDOT Section 7-09.3. Fully extend each joint of restrained joint piping during installation.
- B. Rubber Gasket of Joint:
 - 1. Cleaning and Assembling Joint: Clean the inside of the bell to remove oil, grit, tar (other than standard coating) and other foreign material from the joint. Flex the circular rubber gasket inward and insert in the gasket seat provided in the socket, then release with the gasket fitting over the bead in the gasket seat. Apply a thin film of gasket lubricant to the inside surface of the gasket. Gasket lubricant shall be as supplied by the pipe manufacturer and approved by the Engineer.

2. Clean the spigot end of the pipe and enter into the rubber gasket in the socket, using care to keep the joint from contacting the ground. Complete the joint by forcing the plain end to the bottom of the socket using a device approved by the Engineer. Pipe that is not furnished with a depth mark shall be marked before assembly to ensure that the spigot end is inserted to the full depth of the joint.

3.05 VALVE INSTALLATION

- A. Inspect all valves upon delivery in the field to ensure proper working order before installation. Set and joint to the pipe in the manner set forth in the AWWA Standards for the type of connection ends furnished. Inspect the valves carefully for damage to the outer protective coatings. Where the coating has been ruptured or scraped off, clean the damaged area thoroughly to expose the iron base installation, and recoat the cleaned area with two or more field coats of Quigley Triple A-1 0, Triple A-20, or approved equal.
- B. Install valves in the positions shown on the drawings and provide with a valve box, where required, so arranged that no load or shock will be transmitted to the valve. Center the box over the operating nut, and set the box cover flush with the finished paved surface.
- C. After installation, all valves shall be subjected to the field test for piping. If defects in design, materials, or workmanship appear during these tests, correct such defects with the least possible delay as directed by the Engineer.
- D. Valve boxes shall be positioned during backfill to be in a plumb alignment. Valve box shall not rest directly on the body of the valve, or the water main. Set the upper casting flush with finish pavement and align to match grade.
- E. Concrete pad with rebar as shown on the valve details shall be constructed where indicated on the Drawings. Construction, materials and finished of the concrete shall conform to section 03 30 00 – Cast-in-Place Concrete. The concrete pad shall be set flush with the immediately surrounding finished grade.

3.06 SETTING FIRE HYDRANTS

- A. Fire hydrants shall be installed at the locations indicated on the Drawings and in accordance with the details on the Drawings and WSDOT Standard Specification Section 7-14.3.

3.07 THRUST BLOCKS FOR BURIED PIPE

- A. Concrete thrust blocking shall be constructed in accordance with the details on the drawings and WSDOT Standard Specifications Section 7-09.3(21).

3.08 BLOWOFF ASSEMBLIES

- A. Blowoff assemblies shall be constructed at the locations indicated on the Drawings and in accordance with the WSDOT Standard Plans.

3.09 FIELD TESTS

- A. Test all piping and appurtenances in accordance with the requirements of WSDOT Standard Specifications Section 7-09.3 (23), Tacoma Water and Tacoma Fire Department.

- B. Test copper pipe on wharf in accordance with pipe and fitting manufacturer's requirements.

3.10 FLUSHING & DISINFECTION OF POTABLE WATER LINES

- A. Before being placed in service, flush and disinfect all new, repaired portions, or extensions of potable water lines in accordance with the requirements of WSDOT Standard Specifications Section 7-09.3(24) and 7-09.3(24)A and Tacoma Water. Dispose of test water in accordance with applicable regulations.

3.11 FLUSHING OF FIRE WATER LINES

- A. Before being placed in service, flush all new, repaired portions, or extensions of fire water lines in accordance with the requirements of WSDOT Standard Specifications Section 7-09.3(24)A, Tacoma Water and Tacoma Fire Department. Dispose of test water in accordance with applicable regulations.

END OF SECTION

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. The location and extent of "Sanitary Sewage Utilities" work is indicated on the drawings. The work includes the requirements for furnishing and installing sanitary sewer pipe and sanitary sewer structures. Sanitary lift station and force main are covered under 33 32 13 Sewage Lift Station.

1.02 QUALITY ASSURANCE

- A. Qualification of Workers: Employ the services of a qualified utility contractor, who will be thoroughly familiar with the type of materials being installed and the best methods for their installation, and who shall direct all work performed under this section.
- B. Codes and Standards: Comply with the applicable provisions of all pertinent codes and regulations. References made herein for manufactured materials, such as pipe, fittings, valves, hydrants and specialties; refer to designations for American Water Works Association (AWWA), American National Standards Institute (ANSI) and to the latest edition of the Standard Specifications and Standard Plans for Road, Bridge, and Municipal Construction prepared jointly by the Washington State Department of Transportation (WSDOT) and the American Public Works Association (APWA).

1.03 SUBMITTALS

Submit the following in accordance with Section 01 33 00 - Submittal Procedures for the following products:

- A. Manufacturer's literature and cut sheets for pipes and fittings including couplings and gaskets.
- B. Manufacturer's literature on manholes, cleanouts, covers, lids, grates and frames.

1.04 PRODUCT HANDLING

- A. Pipe shall be handled in conformance with section 7-09.3 (13) of the WSDOT Standard Specifications. Handle pipe to prevent damage to the pipe, pipe lining, or coating. Damage to the pipe, pipe lining, or coating, if any, shall be repaired as directed by the Engineer or replaced at the Contractor's expense.
- B. At times when pipe laying is not in progress, close the open ends of the pipe with a watertight plug or by other means approved by the Engineer to ensure cleanliness inside the pipe.

PART 2 – PRODUCTS

2.01 PIPE AND FITTINGS

- A. Polyvinyl Chloride (PVC) Gravity Sewer Pipe and Fittings:
 - 1. PVC Pipe and fittings shall be in accordance with WSDOT Standard Specifications Section 9-05.12 and approved for sanitary sewer use.
- B. Sanitary Sewer Force Main (SSFM) Pipe:
 - 1. SSFM pipe shall be High Density Polyethylene (HDPE) manufactured from PE4710 resin conforming to ASTM D3350. Pipe shall be manufactured in

accordance with AWWA C901 and shall be pressure class 200 or greater, sized in accordance with IPS outside diameter sizes.

2.02 MANHOLES

- A. Manholes shall be of precast concrete with ductile iron castings. Materials shall be in accordance with the applicable references within WSDOT Standard Specifications Section 7-05.2.
 - 1. Manhole rings and covers shall be non-locking heavy duty ductile iron castings of the size and style indicated on the Drawings. Covers shall be embossed 3" high with "SEWER" in the center.
 - 2. Provide watertight rubber gaskets at matching segments of precast units.
 - 3. All manhole blockouts for pipes shall be fitted with flexible boot connection conforming to the requirements of ASTM C923, Kor-N-Seal or approved equal.
 - 4. Manhole steps shall be copolymer polypropylene plastic manufactured by Lane International or approved equal.

2.03 BACKFLOW PREVENTER

Sanitary sewer backflow preventer shall be backwater valve designed for sanitary sewer use, conforming to ASTM D-1784 and ASME A112.14.1.

2.04 ACCESSORIES

- A. Adapters and Couplings: Coupling adapters at tie-ins to existing pipes, if required, shall be Smith Blair or approved equal.

PART 3– EXECUTION

3.01 TRENCHING, BEDDING AND BACKFILL

- A. All earthwork related to sanitary sewer piping shall conform to the requirements of Section 31 00 00 – Earthwork, Section 31 23 33 - Trenching and Backfilling and Section 31 23 19 - Dewatering and the details and notes on the Drawings. Provide shoring as necessary to support existing items noted to remain in place.
- B. In the event that water is encountered or accumulates in the trench, it shall be removed during the pipe-laying operation and be maintained in a water-free condition until the ends of the pipe are sealed and provisions are made to prevent floating of the pipe. At no time allow trench water to enter the pipe.

3.02 SURVEYS

- A. Layout of alignment and grade of site sewer piping shall be established by a Land Surveyor State licensed in Washington. Check the line and grade during installation to ensure that the Work is within the following allowable tolerances:
 - 1. Fine grade and prepare bedding so the pipe can be initially placed with a variation from true line or grade, measured at each joint, of not more than 1/32 inch per inch diameter or 1/2 inch maximum, provided that:
 - a. A resulting level or backsloping length of pipe does not occur; and

- b. No more than one half of the permissible variation shall be accumulated between successive joints.
- c. Pipe laid within these tolerances shall not be subjected to any further adjustment. Measurement for grade shall be taken at the pipe invert, NOT TOP OF PIPE. Eccentricity of pipe barrels, with respect to jointing surfaces, shall not produce grade interruption adverse to flow of more than 1/4 inch maximum.

3.03 INSTALLATION OF UNDERGROUND PIPE

- A. Furnish all necessary machinery for the work and pump, bail, or otherwise remove any water which accumulates in the trench. Perform all work necessary to keep the trench clear of water while the foundation and the masonry are being constructed or the pipe is being laid.
- B. Placing: Place the pipe from downstream to upstream with the bells pointing upstream in appropriate bedding graded to conform with the grades and alignment indicated on the Drawings and prepared as specified. Ensure that the pipe has a full, solid bearing along its entire length. Provide small depressions for pipe bells when utilized. Make minor adjustments to line and grade by scraping away, or filling in with, bedding material. Do not support pipes on blocks or mounds of any nature.
- C. Jointing: Take care to properly align the pipe and clean the bell and spigot or tongue of the pipe. Gaskets must be straight, properly lubricated and without twist. The pipe shall be partially supported by hand, sling, or crane, as required, to minimize lateral pressure on the gasket and to maintain concentricity until the pipe has been forced into final longitudinal position in accordance with the manufacturer's recommendations. Pipe handling, after the gasket has been affixed, shall be carefully controlled to avoid bumping the gasket and, thus, knocking it out of position or loading it with dirt or other foreign material. Gaskets so disturbed shall be removed, cleaned, relubricated and replaced before the joint is attempted.
- D. Apply sufficient restraint to the line to ensure that the joints, once home, are held so by tamping fill material under and alongside the pipe. At the end of the day's work, block the last pipe in such a manner as may be required to prevent creep during down time.

3.04 HANDLING THE PIPE

- A. During installation, handle the pipe as specified in paragraph 1.05 above. Pipe that has become damaged shall be removed from the trench, cleaned, and repaired as required and re-laid.

3.05 LAYING PIPE

- A. Furnish all necessary machinery for the Work and pump, bail or otherwise remove water which accumulates in the trench. Perform all Work necessary to keep the trench clear of water while the foundation and masonry are being constructed or the pipe is being laid.
 - 1. Placing: Place the pipe on appropriate bedding graded to conform with the grades and alignment indicated on the drawings and prepared as specified. Exercise care that the pipe has a full, solid bearing along its entire length. Make small depressions for pipe bells when utilized. Make minor adjustments to line and grade by scraping away, or filling in bedding material. Do not support pipes on blocks or mounds of any nature.

2. Ductile Pipe: Join and install ductile-iron pipe with ductile-iron or cast-iron push-on joint fittings and rubber gaskets in accordance with AWWA C600, except that anchorages are not required.

3.05 MANHOLES

- A. Furnish all necessary machinery for the Work and pump, bail or otherwise remove water which accumulates in the trench. Perform all Work necessary to keep the trench clear of water while the foundation and masonry are being constructed or the pipe is being laid.
 1. Place manholes at the elevation and location indicated on the drawings, upon the appropriate bedding prepared in accordance with Section 31 00 00 - Earthwork.
 2. Construct cast-in-place manholes in accordance with the drawings. Concrete and reinforcing steel shall conform to the requirements of Division 3 - Concrete.
 3. Carefully place precast manholes on the prepared bedding to be fully and uniformly supported in true alignment, and ensure that all entering pipes can be inserted on the proper grade.
 4. Thoroughly wet all lift holes and all joints between precast elements; completely fill with mortar and smoothed and pointed both inside out, to ensure watertightness.
 5. Place and align precast sections to provide vertical sides and vertical alignment of the ladder rungs. The completed manhole shall be rigid, true to dimensions and watertight.
 6. In precast manhole sections where steel loops have been provided in lieu of lift holes, remove the loops flush with the inside wall surface after the manhole has been completed. No sharp cutoff protrusions will be permitted. If concrete spalling occurs as a result of the loop removal, restore the spalled area with mortar to a uniform smooth surface.
 7. Grade Adjustments: Initially construct manholes of the type noted on the project drawings so as to provide adjustment space for setting cover fastenings to a finished grade. The manhole grade furnished by the Engineer for manhole construction indicates the approximate top grade for the manhole plus or minus two-tenths foot, and the final grade will be set by the Engineer after backfilling has been completed to the grade established by the Engineer.
 8. Where Work is in paved areas which have been brought to grade, provide not less than eight inches or more than 16 inches between the top of the cone or slab and the underside of the manhole casting ring for adjustment of the casting ring to grade.
 9. Pipe Connections: Place all un-reinforced pipes entering or leaving the manhole on firmly compacted bedding, particularly within the area of the manhole excavation, which normally is deeper than that of the sewer trench. Take special care to see that the openings through which pipes enter the structure are completely and firmly rammed full of mortar to ensure watertightness.

10. Backfill: Hand-place backfill around the manhole and extending at least one pipe length into each trench and tamp with selected material up to an elevation of six inches above the crown of all entering pipes. Work shall conform to the applicable provisions of Section 31 00 00 - Earthwork.

3.06 ACCEPTANCE TESTING

- A. After completion of the following, authorization from the Engineer shall be required before the Contractor can perform initial acceptance testing:
 1. Acceptable placement of applicable pipe, bedding and backfill material.
 2. Acceptable completion of all applicable manhole channels and grout work.
 3. Acceptable debris removal, cleaning and flushing of all applicable pipes and structures.
- B. Completed gravity pipe installation shall be tested in accordance with the Low Pressure Air Test requirements of WSDOT Section 7-17.3(2)F. Infiltration testing in accordance with WSDOT Section 7-17.3(2)C is required for pipe installed below the ground water elevation.
- C. Completed sanitary sewer force main installation shall be tested in accordance with the Hydrostatic Pressure Test requirements of WSDOT Section 7-09.3(23), except that hydrostatic pressure used for testing shall be 150 psi.
- D. Before final acceptance, the Contractor shall inspect all drainage lines, 6 inches and larger diameter, by the use of a television camera, utilizing a Port approved independent inspection service company. The television inspection requirements shall include the provisions of:
 1. A color analog/digital camera with pan and tilt capacity in order to view all main lines, lateral lines, and structures including channels.
 2. A dye solution to be introduced in sufficient quantity to travel from the structure that is the highest point of inspection to the downstream terminus of the inspection limits. Red or purple dye shall be used for PVC pipe and green dye for ductile iron and concrete pipe.
 3. A one-inch reference ball to be mounted to the camera in order to drag along the bottom of the pipe during the entire inspection procedure.
 4. Linear measure references to be measured from the center of the beginning structure to the center of the next inline structure and include the direction of flow. The locations of lateral pipes and all distinctive pipe conditions shall be referenced to the centerline of the beginning structure. All structure references shall utilize the designated structure reference numbers shown on the plans.
- E. The following television inspection information shall be provided to the Engineer:

1. A clear movie format on DVD which encompasses the limits of the inspection area and including all reference data as described herein. A tape reference time and date for the start of each run shall also be indicated.
2. A written report shall be provided corresponding to the taped inspection and including all reference data as described herein. The report shall consist of a written narrative of all distinctive pipe conditions including ponding areas in excess of ¼ inch

END OF SECTION

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. The location and extent of the Sewage Lift Station work is indicated on the Drawings. The work includes the furnishing of a complete sewage lift station including pumps, controllers and appurtenances as well as any associated electrical and force main work.

1.02 QUALITY ASSURANCE

- A. The Port will provide testing and inspection service to the satisfaction of the Engineer. The Contractor may obtain test results from the Engineer at no cost. Tests conducted for the sole benefit of the Contractor, or before a product is approved, shall be at the Contractor's expense.
- B. Qualifications of Workmen: Employ at least one person who shall be present at all times during execution of this portion of the work, shall have all portions of the Drawings and Specifications applicable to the portion of the Contract, shall be thoroughly familiar with the types of materials being installed and the best methods for their installation, and shall direct all work performed under this Section.
- C. Codes and Standards: The Contractor shall comply with the applicable provisions of all pertinent codes and regulations including but not limited to:
 - 1. ANSI A21.10 force main fittings
 - 2. ANSI A21.50/AWWA C150 force main thickness
 - 3. ANSI A21:51/AWWA C151 force main ductile iron
 - 4. NEMA 3 weatherproof duplex control panel, dead-front enclosure
 - 5. UL-approved control panel
 - 6. U.L. Class 1, Group D label submersible electric motors

1.03 SUBMITTALS

- A. Submit materials data in accordance with of Section 01 33 00 - Submittals. Furnish manufacturers' technical literature, standard details, product specifications, and installation instructions for all products. No piecemeal submittals will be accepted. Submittals shall include the following:
 - 1. Submit shop drawings of the lift station.
 - 2. Product Data: Submit to the Engineer manufacturer's standard drawings or catalog cuts for all pipe, fittings, structures, valves, pumps, and controls noted under "Products" in this section. The pump supplier shall certify that the electrical control information submitted is coordinated with the mechanical equipment prior to submittal.
 - 3. Certificates of Conformance: Submit to the Engineer manufacturer's Certificate of Conformance for each of the materials which are specified to conform to publications referenced under "Products" in this section.
 - 4. Submit a list of spare parts to be provided.
 - 5. Test Results: Submit to the Engineer all test results required by this specification.

1.04 OPERATING CONDITIONS

- A. The pumps shall be capable of delivering 15 GPM against a rated total dynamic head of 0 feet (0 PSIG), 11 GPM against a rated total dynamic head of 92 feet (40 PSIG), and 7.8 GPM against a rated total dynamic head of 185 feet (80 PSIG). The pump(s) must also be capable of operating at negative total dynamic head without overloading the motor(s). Under no conditions shall in-line piping or valving be allowed to create a false apparent head.

1.05 WARRANTY

- A. The grinder pump Manufacturer shall provide a part(s) and labor warranty on the complete station and accessories, including, but not limited to, the panel for a period of 24 months after notice of Ports acceptance, but no greater than 27 months after receipt of shipment. Any manufacturing defects found during the warranty period will be reported to the Manufacturer by the Port and will be corrected by the Manufacturer at no cost to the Port.

PART 2 - PRODUCTS

2.01 SINGLE SOURCE RESPONSIBILITY

- A. All products associated with the wet well and pumps shall be sourced from a single supplier to ensure compatibility and functionality as a single unit. Products must be preassembled prior to delivery to the project site to ensure compatibility and clearances. Single source supplier shall be responsible for the proper function of all equipment supplied regardless of the manufacturer. The Contractor is not relieved of responsibility to coordinate and install nor is the Contractor relieved of any guarantees required for workmanship.

2.02 PUMP

- A. The pump shall be a custom designed, integral, vertical rotor, motor driven, solids handling pump of the progressing cavity type with a single mechanical seal. Double radial O-ring seals are required at all casting joints to minimize corrosion and create a protective barrier. All pump castings shall be cast iron, fully epoxy coated to 8-10 mil Nominal dry thickness, wet applied. The rotor shall be through-hardened, highly polished, precipitation hardened stainless steel. The stator shall be of a specifically compounded ethylene propylene synthetic elastomer. This material shall be suitable for domestic wastewater service. Its physical properties shall include high tear and abrasion resistance, grease resistance, water and detergent resistance, temperature stability, excellent aging properties, and outstanding wear resistance. Buna-N is not acceptable as a stator material because it does not exhibit the properties as outlined above and required for wastewater service.

2.03 GRINDER

- A. The grinder shall be placed immediately below the pumping elements and shall be direct-driven by a single, one-piece motor shaft. The grinder impeller (cutter wheel) assembly shall be securely fastened to the pump motor shaft by means of a threaded connection attaching the grinder impeller to the motor shaft. Attachment by means of pins or keys will not be acceptable. The grinder impeller shall be a one-piece, 4140 cutter wheel of the rotating type with inductively hardened cutter teeth. The cutter teeth shall be inductively hardened to Rockwell 50 – 60c for abrasion resistance. The shredder ring shall be of the stationary type and the material shall be white cast iron. The teeth shall be ground into the material to achieve effective grinding. The

shredder ring shall have a staggered tooth pattern with only one edge engaged at a time, maximizing the cutting torque. These materials have been chosen for their capacity to perform in the intended environment as they are materials with wear and corrosive resistant properties.

This assembly shall be dynamically balanced and operate without objectionable noise or vibration over the entire range of recommended operating pressures. The grinder shall be constructed so as to minimize clogging and jamming under all normal operating conditions including starting. Sufficient vortex action shall be created to scour the tank free of deposits or sludge banks which would impair the operation of the pump. These requirements shall be accomplished by the following, in conjunction with the pump:

1. The grinder shall be positioned in such a way that solids are fed in an upward flow direction.
2. The maximum flow rate through the cutting mechanism must not exceed 4 feet per second. This is a critical design element to minimize jamming and as such must be adhered to.
3. The inlet shroud shall have a diameter of no less than 5 inches. Inlet shrouds that are less than 5 inches in diameter will not be accepted due to their inability to maintain the specified 4 feet per second maximum inlet velocity which by design prevents unnecessary jamming of the cutter mechanism and minimizes blinding of the pump by large objects that block the inlet shroud.
4. The impeller mechanism must rotate at a nominal speed of no greater than 1800 rpm.

The grinder shall be capable of reducing all components in normal domestic sewage, including a reasonable amount of "foreign objects," such as paper, wood, plastic, glass, wipes, rubber and the like, to finely-divided particles which will pass freely through the passages of the pump and the 1-1/4" diameter stainless steel discharge piping.

2.04 ELECTRIC MOTOR

- A. As a maximum, the motor shall be a 1 HP, 1725 RPM, 240 Volt 60 Hertz, 1 Phase, capacitor start, ball bearing, air-cooled induction type with Class F installation, low starting current not to exceed 30 amperes and high starting torque of 8.4 foot pounds. The motor shall be press-fit into the casting for better heat transfer and longer winding life. Inherent protection against running overloads or locked rotor conditions for the pump motor shall be provided by the use of an automatic-reset, integral thermal overload protector incorporated into the motor. This motor protector combination shall have been specifically investigated and listed by Underwriters Laboratories, Inc., for the application. Non-capacitor start motors or permanent split capacitor motors will not be accepted because of their reduced starting torque and consequent diminished grinding capability. The wet portion of the motor armature must be 300 Series stainless. To reduce the potential of environmental concerns, the expense of handling and disposing of oil, and the associated maintenance costs, oil-filled motors will not be accepted.

2.05 MECHANICAL SEAL

- A. The pump/core shall be provided with a mechanical shaft seal to prevent leakage between the motor and pump. The seal shall have a stationary ceramic seat and

carbon rotating surface with faces precision lapped and held in position by a stainless steel spring.

2.06 TANK AND ACCESSWAY

- A. High Density Polyethylene Construction. The tank shall be a Wetwell/Drywell design made of high density polyethylene, with a grade selected to provide the necessary environmental stress cracking resistance. Corrugated sections are to be made of a double wall construction with the internal wall being generally smooth to promote scouring. The corrugations of the outside wall are to be a minimum amplitude of 1-1/2" to provide necessary transverse stiffness. Any incidental sections of a single wall construction are to be 0.250" thick (minimum). All seams created during tank construction are to be thermally welded and factory tested for leak tightness. The tank wall and bottom must withstand the pressure exerted by saturated soil loading at maximum burial depth. All station components must function normally when exposed to 150 percent of the maximum external soil and hydrostatic pressure.
- B. The tank shall be furnished with one EPDM grommet fitting to accept a 4.50" OD DWV or Schedule 40 pipe. The tank capacities shall be as shown on the contract drawings.
- C. The Drywell accessway shall be an integral extension of the Wetwell assembly and shall include a lockable cover assembly providing low profile mounting and watertight capability. The cover shall be high density polyethylene, green in color, with a load rating of 150 lbs per square foot. The accessway design and construction shall enable field adjustment of the station height in increments of 3" or less without the use of any adhesives or sealants requiring cure time before installation can be completed.
- D. The station shall have all necessary penetrations molded in and factory sealed. To ensure a leak free installation no field penetrations will be acceptable.
- E. All discharge piping shall be constructed of 304 stainless steel. The discharge shall terminate outside the accessway bulkhead with a stainless steel, 1-1/4" Female NPT fitting. The discharge piping shall include a stainless steel ball valve rated for 235 psi WOG; PVC ball valves or brass ball/gate will not be accepted. The bulkhead penetration shall be factory installed and warranted by the manufacturer to be watertight.
- F. The accessway shall include a single NEMA 6P Electrical Quick Disconnect (EQD) for all power and control functions, factory installed with accessway penetrations warranted by the manufacturer to be watertight. The EQD will be supplied with 32', 25' of useable Electrical Supply Cable (ESC) outside the station, to connect to the alarm panel. The ESC shall be installed in the basin by the manufacturer. Field assembly of the ESC into the basin is not acceptable because of potential workmanship issues. The EQD shall require no tools for connecting, seal against water before the electrical connection is made, and include radial seals to assure a watertight seal regardless of tightening torque. Plug-type connections of the power cable onto the pump housing will not be acceptable due to the potential for leaks and electrical shorts. A junction box shall not be permitted in the accessway due to the large number of potential leak points. The EQD shall be so designed to be conducive to field wiring as required. The accessway shall also include an integral 2-inch vent to prevent sewage gases from accumulating in the tank.

2.07 CHECK VALVE

- A. The pump discharge shall be equipped with a factory installed, gravity operated, flapper-type integral check valve built into the stainless steel discharge piping. The check valve will provide a full-ported passageway when open, and shall introduce a friction loss of less than 6 inches of water at maximum rated flow. Moving parts will be made of a 300 Series stainless steel and fabric reinforced synthetic elastomer to ensure corrosion resistance, dimensional stability, and fatigue strength. A nonmetallic hinge shall be an integral part of the flapper assembly providing a maximum degree of freedom to assure seating even at a very low back-pressure. The valve body shall be an injection molded part made of an engineered thermoplastic resin. The valve shall be rated for continuous operating pressure of 235 psi. Ball-type check valves are unacceptable due to their limited sealing capacity in slurry applications.

2.08 ANTI-SIPHON VALVE

- A. The pump discharge shall be equipped with a factory-installed, gravity-operated, flapper-type integral anti-siphon valve built into the stainless steel discharge piping. Moving parts will be made of 300 Series stainless steel and fabric-reinforced synthetic elastomer to ensure corrosion resistance, dimensional stability, and fatigue strength. A nonmetallic hinge shall be an integral part of the flapper assembly, providing a maximum degree of freedom to ensure proper operation even at a very low pressure. The valve body shall be injection-molded from an engineered thermoplastic resin. Holes or ports in the discharge piping are not acceptable anti-siphon devices due to their tendency to clog from the solids in the slurry being pumped. The anti-siphon port diameter shall be no less than 60% of the inside diameter of the pump discharge piping.

2.09 CORE UNIT

- A. The grinder pump station shall have a cartridge type, easily removable core assembly consisting of pump, motor, grinder, all motor controls, check valve, anti-siphon valve, level controls, electrical quick disconnect and wiring. The core unit shall be installed in the basin by the manufacturer. Field assembly of the pump and controls into the basin is not acceptable because of potential workmanship issues and increased installation time. In some cases, stations taller than 96" may be shipped on their side without the cores assembled in the basin for freight purposes but this is the only exception. The core unit shall seal to the tank deck with a stainless steel latch assembly. The latch assembly must be actuated utilizing a single quick release mechanism requiring no more than a half turn of a wrench. The watertight integrity of each core unit shall be established by a 100 percent factory test at a minimum of 5 PSIG.

2.10 CONTROLS

- A. All necessary motor starting controls shall be located in the cast iron enclosure of the core unit secured by stainless steel fasteners. Locating the motor starting controls in a plastic enclosure is not acceptable. The wastewater level sensing controls shall be housed in a separate enclosure from motor starting controls. The level sensor housing must be sealed via a radial type seal; solvents or glues are not acceptable. The level sensing control housing must be integrally attached to pump assembly so that it may be removed from the station with the pump and in such a way as to minimize the potential for the accumulation of grease and debris accumulation, etc. The level sensing housing must be a high-impact thermoplastic copolymer over-molded with a

thermo plastic elastomer. The use of PVC for the level sensing housing is not acceptable.

- B. Non-fouling wastewater level controls for controlling pump operation shall be accomplished by monitoring the pressure changes in an integral air column connected to a pressure switch. The air column shall be integrally molded from a thermoplastic elastomer suitable for use in wastewater and with excellent impact resistance. The air column shall have only a single connection between the water level being monitored and the pressure switch. Any connections are to be sealed radially with redundant O-rings. The level detection device shall have no moving parts in direct contact with the wastewater and shall be integral to the pump core assembly in a single, readily-exchanged unit. Depressing the push to run button must operate the pump even with the level sensor housing removed from the pump.
- C. All fasteners throughout the assembly shall be 300 Series stainless steel. High-level sensing will be accomplished in the manner detailed above by a separate air column sensor and pressure switch of the same type. Closure of the high-level sensing device will energize an alarm circuit as well as a redundant pump-on circuit. For increased reliability, pump ON/OFF and high-level alarm functions shall not be controlled by the same switch. Float switches of any kind, including float trees, will not be accepted due to the periodic need to maintain (rinsing, cleaning) such devices and their tendency to malfunction because of incorrect wiring, tangling, grease buildup, and mechanical cord fatigue. To assure reliable operation of the pressure switches, each core shall be equipped with a factory installed equalizer diaphragm that compensates for any atmospheric pressure or temperature changes. Tube or piping runs outside of the station tank or into tank-mounted junction boxes providing pressure switch equalization will not be permitted due to their susceptibility to condensation, kinking, pinching, and insect infestation. The grinder pump will be furnished with a 6 conductor 14 gauge, type SJOW cable, pre-wired and watertight to meet UL requirements with a FACTORY INSTALLED NEMA 6P EQD half attached to it.

2.11 FITTINGS

- A. All plastic fitting components are to be in compliance with applicable ASTM standards.
- B. All pipe connections shall be made using compression fitting connections including a Buna-N O-ring for sealing to the outside diameter of the pipe. A split-collet locking device shall be integrated into all pipe connection fittings to securely restrain the pipe from hydraulic pressure and external loading caused by shifting and settling.

2.12 CURB BOXES

- A. Curb boxes shall be constructed of ABS, conforming to ASTM-D 1788. Lid top casting shall be cast iron, conforming to ASTM A-48 Class 25, providing magnetic detectability, and be painted black. All components shall be inherently corrosion-resistant to ensure durability in the ground. Curb boxes shall provide height adjustment downward (shorter) from their nominal height.

2.13 ALARM PANEL

- A. Each grinder pump station shall include a NEMA 4X, UL-listed alarm panel suitable for wall or pole mounting. The NEMA 4X enclosure shall be manufactured of thermoplastic polyester to ensure corrosion resistance. The enclosure shall include a hinged, lockable cover with padlock, preventing access to electrical components, and creating a secured safety front to allow access only to authorized personnel. The

enclosure shall not exceed 10.5" W x 14" H x 7" D, or 12.5" W x 16" H x 7.5" D if certain options are included.

- B. The alarm panel shall contain one 15-amp, double-pole circuit breaker for the pump core's power circuit and one 15-amp, single-pole circuit breaker for the alarm circuit. The panel shall contain a push-to-run feature, an internal run indicator, and a complete alarm circuit. All circuit boards in the alarm panel are to be protected with a conformal coating on both sides and the AC power circuit shall include an auto resetting fuse.
- C. The alarm panel shall include the following features: external audible and visual alarm; push-to-run switch; push-to-silence switch; redundant pump start; and high level alarm capability. The alarm sequence is to be as follows when the pump and alarm breakers are on:
 - 1. When liquid level in the sewage wet-well rises above the alarm level, the contacts on the alarm pressure switch activate, audible and visual alarms are activated, and the redundant pump starting system is energized.
 - 2. The audible alarm may be silenced by means of the externally mounted, push-to-silence button.
 - 3. Visual alarm remains illuminated until the sewage level in the wet-well drops below the "off" setting of the alarm pressure switch.

The visual alarm lamp shall be inside a red, oblong lens at least 3.75" L x 2.38" W x 1.5" H. Visual alarm shall be mounted to the top of the enclosure in such a manner as to maintain NEMA 4X rating. The audible alarm shall be externally mounted on the bottom of the enclosure, capable of 93 dB @ 2 feet. The audible alarm shall be capable of being deactivated by depressing a push-type switch that is encapsulated in a weatherproof silicone boot and mounted on the bottom of the enclosure (push-to-silence button).

- D. The entire alarm panel, as manufactured shall be listed by Underwriters Laboratories, Inc.
- E. Alarm panel shall include the following features and functions:
 - 1. Alarm Activated Dry Contacts – Normally open relay contact closes upon alarm activation.
 - 2. Generator Receptacle and Auto Transfer – The alarm panel shall include a 20 amp, 250 VAC generator receptacle with a spring-loaded, gasketed cover suitably mounted to provide access for connection of an external generator while maintaining a NEMA 4X rating. An automatic transfer switch shall be provided, which automatically switches from AC power to generator power. Power shall be provided to that alarm panel through the generator receptacle whenever power is present at the receptacle, allowing the audible and visual alarms to function normally in generator mode. When power is no longer applied to the generator receptacle, the panel is automatically switched back to the AC Mains power. (No manual switching within the panel enclosure is necessary to switch from generator power back to AC Mains, so the mode cannot be inadvertently left in the generator position after pumping down the station in generator mode as is the case with a manual transfer switch).
 - 3. Service Equipment/Main Service Disconnect Breaker – A separate, internal breaker rated and approved for use as "service equipment" and acts as a main service disconnect of the grinder pump station shall be provided.

4. Run-time/Hour Meter – A run-time or hour meter to display the total run-time or operation time for the pump core shall be provided.
5. Event/Cycle Counter – An event or cycle counter to display the number of operations of the pump core shall be provided.
6. Protective Controls providing protection from the following operating conditions:
 - a. Low Voltage (Brownout) Protection – A lockout cycle will prevent the motor from operating and will illuminate an LED if:
 - 1) the incoming AC Mains voltage drops below a predetermined minimum, typically 12% of nameplate (211 volts for a 240 volt system) for 2 to 3 seconds, regardless of whether the motor is running
 - 2) the lockout cycle will end if the incoming AC Mains voltage returns to a predetermined value, typically 10% of nameplate (216 volts for a 240 volt system)
 - 3) The system continues to retest the voltage every second indefinitely. If the lockout cycle has been initiated and the voltage comes back above the predetermined starting voltage, the system will function normally. The LED remains illuminated during a Brownout condition and remains latched until the pump breaker is turned off and then on again (reset). The audible and visual alarm will not be activated unless there is a high wastewater level in the tank.
 - b. Run Dry Protection – A 20-minute lockout cycle will prevent the motor from operating and will illuminate an LED when the wastewater level in the tank is below the pump inlet level. The condition is rechecked every 20 minutes. If the lockout cycle has been initiated and the condition is satisfied, the pump is not allowed to cycle normally but the LED remains latched. The LED will remain latched until the pump breaker is turned off and then on again (reset). If the condition is not satisfied after 3 consecutive attempts, the visual alarm will be activated until the pump breaker is turned off and on (reset) or until there is one cycle of normal operation. If a high level condition is presented at any time, a pump run cycle will be activated.
 - c. High System Pressure Protection – A 20-minute lockout cycle will prevent the motor from operating and will illuminate an LED when the pressure in the discharge line is atypically high (closed valve or abnormal line plug). The condition is rechecked every 20 minutes. If the condition is satisfied, the pump is allowed to cycle normally but the LED remains latched. If the condition is not satisfied after 3 consecutive attempts, the pump is locked out indefinitely until the condition is removed and power is reset. The LED will remain latched until the pump breaker is turned off and then on again (reset). The audible and visual alarm will be activated.
 - d. In all of the above cases, if more than one error condition is presented, the LED depicting the most recent error condition will be displayed.

2.14 OPERATING FEATURES

- A. Lift station shall include the following operating features:

1. Alarm Activated Dry Contacts – Normally open relay contact closes upon alarm activation.
2. Remote Indoor Alarm Module – will work with or without power to the alarm panel
3. Alarm Activated Contacts for Remote Indoor Alarm Module
4. High/Low Voltage monitoring with Trouble indication
5. High/Low Wattage monitoring with Trouble indication
6. Extended Run Time monitoring with Trouble indication
7. Cycle/Event Counter
8. Run Time Counter (Hour Meter)
9. Run Time Limit — time adjustable, user-selected options: 10 minutes (default) to 120 minutes in 1-minute intervals
10. Power-up Delay — time adjustable, user-selected options: None (default), to 300 minutes in 1-minute intervals
11. Alarm Delay — time adjustable, user-selected options: None (default) or adjustable in 1-minute intervals
12. System self-test diagnostic
13. User-selectable Alarm latch
14. User-selectable Protect Mode disable
15. User-selectable buzzer timer
16. Ready LED to indicate AC power to the station is satisfactory
17. Pump Run LED to indicate pump is operating
18. Trouble LED indicator and predictive Visual Alarm notification (“blinking” alarm lamp; clears on Normal cycle)
19. High Level Alarm LED indicator
20. Manual Run switch to manually activate pump
21. Menu-driven programmable controller with navigation overlay-type buttons (Enter, Scroll, Up, Down)
22. Normal Operation LED and Mode button for Mode status
23. Pump Performance menu LED with LCD Display of the following pump performance statistics:
 - a. Real-time Voltage
 - b. Real-time Amperage
 - c. Real-time Wattage
 - d. Minimum/Maximum/Average Voltage
 - e. Minimum/Maximum/Average Amperage
 - f. Minimum/Maximum/Average Wattage
 - g. Minimum/Maximum Run-time

- h. Average Run-time
- i. Last Run-time
- j. Cycle/Event Counter
- k. Run Time Counter (Hour Meter)

24. Diagnostics Menu LED

25. Initialize System Menu LED

26. Run Limit Menu LED

27. Alarm Delay Menu LED

28. Power Delay Menu LED

2.15 SERVICEABILITY

- A. The grinder pump core, including level sensor assembly, shall have two lifting hooks complete with lift-out harness connected to its top housing to facilitate easy core removal when necessary. The level sensor assembly must be easily removed from the pump assembly for service or replacement. All mechanical and electrical connections must provide easy disconnect capability for core unit removal and installation. Each EQD half must include a water-tight cover to protect the internal electrical pins while the EQD is unplugged. A pump push-to-run feature will be provided for field trouble shooting. The push-to-run feature must operate the pump even if the level sensor assembly has been removed from the pump assembly. All motor control components shall be mounted on a readily replaceable bracket for ease of field service.

2.16 OSHA CONFINED SPACE

- A. All maintenance tasks for the grinder pump station must be possible without entry into the grinder pump station (as per OSHA 1910.146, permit-required confined spaces).

2.17 SAFETY

- A. The grinder pump shall be free from electrical and fire hazards as required in a residential environment. As evidence of compliance with this requirement, the completely assembled and wired grinder pump station shall be listed by Underwriters Laboratories, Inc. to be safe and appropriate for the intended use. UL listing of components of the station, or third-party testing to UL standard are not acceptable.
- B. The grinder pump shall meet accepted standards for plumbing equipment for use in or near residences, shall be free from noise, odor, or health hazards, and shall have been tested by an independent laboratory to certify its capability to perform as specified in either individual or low pressure sewer system applications. As evidence of compliance with this requirement, the grinder pump shall bear the seal of NSF International. Third-party testing to NSF standard is not acceptable.

2.18 SPARE PARTS

- A. Provide a complete tool kit containing all necessary non-standard tools to dismantle pump and replace seals.
 - 1. Provide the following spare parts for each pump
 - a. (2) Complete replacement mechanical seal assemblies
 - b. (2) Volute gaskets

- c. (6) Complete and bound operating and maintenance instructions, including electrical wiring diagrams, shall be provided to the Port. A complete lubrication and maintenance chart shall be furnished. Instructions shall include complete parts lists for all equipment and detailed instructions for changing pump seals. The complete operating instructions shall accompany the lift station when delivered to the Project Site.

PART 3 - EXECUTION

3.01 ALIGNMENT AND GRADE

- A. Layout the sewer mains for alignment and grade as shown on the project drawings.

3.02 TRENCHING FOR PIPE

- A. Excavate trenches to the alignments and depths indicated on the Drawings. See Section 31 00 00 - Earthwork of these specifications.

3.03 BACKFILL AND UTILITIES BEDDING

- A. Install backfill and bedding as indicated on the Drawings and as specified in Section 31 00 00 - Earthwork. Do not backfill trenches until all tests and inspections have been made.

3.04 ELECTRICAL

- A. All electrical work shall be conducted in strict accordance with the requirements of Division 16 – Electrical and manufacturer's written instructions and recommendations.

3.05 FACTORY TESTING

- A. Each grinder pump shall be submerged and operated for 1.5 minutes (minimum). Included in this procedure will be the testing of all ancillary components such as, the anti-siphon valve, check valve, discharge assembly and each unit's dedicated level controls and motor controls. All factory tests shall incorporate each of the above listed items. Actual appurtenances and controls which will be installed in the field shall be particular to the tested pump only. A common set of appurtenances and controls for all pumps is not acceptable. Certified test results shall be available upon request showing the operation of each grinder pump at two different points on its curve. Additional validation tests include: integral level control performance, continuity to ground and acoustic tests of the rotating components.

3.06 DELIVERY

- A. All grinder pump units will be delivered to the job site 100 percent completely assembled, including testing, ready for installation. Field installation of the pump in tanks under 96 inches is not allowed. Field installation of the level sensor into the tank is not allowed. Grinder pump stations will be individually mounted on wooden pallets.

3.07 LIFT STATION INSTALLATION

- A. Installation shall be accomplished so that 1 inch to 4 inches of accessway, below the bottom of the lid, extends above the finished grade line. The finished grade shall slope away from the unit. The diameter of the excavated hole must be large enough to allow for the concrete anchor.
- B. A 6" inch (minimum) layer of naturally rounded aggregate, clean and free flowing, with particle size of not less than 1/8" or more than 3/4" shall be used as bedding material under each unit.

- C. A concrete anti-flotation collar, as detailed on the drawings, and sized according to the manufacturer's instructions, shall be required and shall be pre-cast to the grinder pump or poured in place. Each grinder pump station with its pre-cast anti-flotation collar shall have a minimum of three lifting eyes for loading and unloading purposes.
- D. If the concrete is poured in place, the unit shall be leveled, and filled with water, to the bottom of the inlet, to help prevent the unit from shifting while the concrete is being poured. The concrete must be manually vibrated to ensure there are no voids. If it is necessary to pour the concrete to a level higher than the inlet piping, an 8" sleeve is required over the inlet prior to the concrete being poured.

3.08 SURFACE RESTORATION

- A. Restore to original condition.

3.09 FIELD TESTING AND ADJUSTING

- A. Test operation of the lift station upon completion of installation and make all adjustments as required to ensure proper operation.
- B. Perform test of sanitary mains in accordance with Section 33 30 00 - Sanitary Sewer Utilities of these Specifications.
- C. The Manufacturer shall provide the services of qualified factory trained technician(s) who shall inspect the placement and wiring of the lift station, perform field tests as specified herein, and instruct the Port personnel in the operation and maintenance of the equipment.
- D. All equipment and materials necessary to perform testing shall be the responsibility of the Contractor. This includes, as a minimum, a portable generator and power cable (if temporary power is required), water in each basin (filled to a depth sufficient to verify the high level alarm is operating), and opening of all valves in the system. These steps shall be completed prior to the qualified factory trained technician(s) arrival on site.
- E. Upon completion of the installation, the authorized factory technician(s) will perform the following tests:
 - 1. Make certain the discharge shut-off valve in the station is fully open.
 - 2. Turn ON the alarm power circuit and verify the alarm is functioning properly.
 - 3. Turn ON the pump power circuit. Initiate the pump operation to verify automatic "on/off" controls are operative. The pump should immediately turn ON.
 - 4. Consult the Manufacturer's Service Manual for detailed start-up procedures.
- F. Upon completion of the start-up and testing, the Manufacturer shall submit to the Engineer the start-up authorization form describing the results of the tests performed for the lift station. Final acceptance of the system will not occur until authorization forms have been received for the lift station and any installation deficiencies corrected.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. The location and extent of the "Storm Drainage Utilities" work is indicated on the Drawings. The work includes the requirements for furnishing and installing storm drain pipes, and storm drain structures.

1.02 QUALITY ASSURANCE

- A. Except as specified in article 3.07 of this Section, the Port will provide testing and inspection service to the satisfaction of the Engineer. The Contractor may obtain test results from the Engineer at no cost. Tests conducted for the sole benefit of the Contractor, or before a product is approved, shall be at the Contractor's expense.
- B. Qualification of Workmen: Employ at least one person who shall be present at all times during execution of this portion of the work, shall have all portions of the Drawings and Specifications applicable to that portion of the contract, shall be thoroughly familiar with the type of materials being installed and the best methods for their installation, and shall direct all work performed under this Section.
- C. Codes and Standards: The Contractor shall comply with the applicable provisions of all pertinent codes and regulations. References made herein for manufactured materials such as pipes, fittings, and specialties refer to designations for the latest edition of materials published by the American Association of State Highway and Transportation Officials (AASHTO), the American Society for Testing Materials (ASTM), the American Public Works Association (APWA) Standard Specification for Municipal Public Works Construction, and the WSDOT/APWA 2018 Standard Specifications for Road, Bridge and Municipal Construction.

1.03 SUBMITTALS

- A. Submit the following in accordance with Section 01 33 00 – "Submittal Procedures" for the following products:
 - 1. Manufacturer's literature on pipe and fitting materials.
 - 2. Manufacturer's certificates of compliance for pipe and fitting materials.
 - 3. Manufacturer's literature on the metal castings for manholes, catch basins and cleanouts.
 - 4. Check Valve manufacturer's flow test data from an accredited hydraulics laboratory.
 - 5. Certificates of compliance with AASHTO HS-25 load rating requirements for precast structures and metal castings.
 - 6. Shop drawings for precast catch basins and manholes.

PART 2 - PRODUCTS

2.01 STORM DRAINAGE PIPE

- A. Corrugated Polyethylene Pipe (CPEP) with diameters less than or equal to 30 inches shall be smooth interior annular exterior corrugations and shall meet or exceed the specifications of ASTM F2736 and AASHTO MP-21. CPEP with diameter greater than 30 inches shall have smooth interior and annular exterior corrugations and shall meet

or exceed the specifications of ASTM F2881 and AASHTO MP-21. Polypropylene shall be an impact modified copolymer.

- B. Polyvinyl chloride (PVC) storm drainage pipe, couplings and fittings shall comply with ASTM D 3034 SDR 35 for pipe diameters less than or equal to 15 inches. PVC storm drainage pipe larger than 15 inch diameter shall conform to ASTM F679. PVC pipe shall have integral bell joints complying with ASTM D 3212 and gaskets conforming to ASTM F477.
- C. Polyvinyl Chloride (PVC) storm drainage pipe below track
- D. Subdrain pipe shall be perforated high density polyethylene (HDPE) pipe with circular perforations conforming to the requirements of AASHTO M252/M294, Class 2.
- E. Ductile iron shall be used at points noted on the Drawings. Ductile Iron pipe shall be push on joint pipe by US Pipe or American Pipe.

2.02 MANHOLES AND CATCH BASINS

- A. Catch Basins shall be of precast concrete and shall be made up from the components indicated on the Drawings and shall conform to the Washington State Department of Transportation Standard Plans for Road, Bridge and Municipal Construction, most recent edition for dimensions and functionality.
- B. Metal frame and grate or cover for catch basins and manholes shall be ductile iron of the size and style indicated on the Drawings.
- C. Ladders and other steel components and hardware shall be coated with HDPE.
- D. Mortar shall be mixed 1:1; Type I cement and sand.

2.03 PIPE COUPLING

- A. Pipe couplings for joining new pipe to existing pipe shall conform to the performance requirements of ASTM C 1173 and shall include a PVC gasket, stainless steel clamps and stainless steel shear ring. Gasket shall conform to ASTM D 5926 with a minimum tensile strength of 1000 psi and minimum elongation at rupture of 250 percent. Shear ring shall be designed to resist heavy earth loads and shear forces, and retain pipe alignment. Shear ring shall be stainless steel, 0.012 inch or greater thickness.

2.04 INLINE CHECK VALVE

- A. Inline check valve shall be all rubber and the flow operated check type with slip-in cuff connection. The valve shall be ply reinforced throughout the body, saddle and bill, which is cured and vulcanized into a one-piece unibody construction. A separate valve body or pipe used as the housing is not acceptable. The valve shall be manufactured with no metal, mechanical hinges or fasteners, which would be used to secure any component of the valve to a valve housing. The port area of the saddle shall contour into a circumferential sealing area (the "bill") that is concentric with the pipe which shall allow passage of flow in one direction while preventing reverse flow. The entire valve shall fit within the pipe inside diameter. The saddle area of the valve must be flat, not conical, and integral with the rubber body above centerline in order to not produce any areas or voids that can collect or trap debris. The valve must be easily installed in pipes with poor end condition without the need to modify or utilize the headwall or structure to seal and anchor the valve.

- B. The CheckMate Ultraflex Valve shall incorporate multiple concave grooves molded integrally into the flat saddle wall thickness extending longitudinally a minimum of 80% of the length of the saddle to reduce opening resistance and reduce headloss.
- C. The valve shall incorporate a custom shaped notch in the end of the bill to reduce cracking pressure. The notch shall be at the invert/bottom of the bill and symmetrical about the valve centerline. The longitudinal length of the notch shall be no greater than half the length of the bill.
- D. The outside diameter of the upstream and downstream sections of the valve must be circumferentially in contact with the inside diameter of the pipe.
- E. Manufacturer must have flow test data from an accredited hydraulics laboratory to confirm pressure drop and hydraulic data.
- F. Company name, plant location, valve size patent number, and serial number shall be bonded to the check valve.

2.05 MOLDED FRP GRATING

- A. A. Manufacture: Grating shall be of a one piece molded construction with tops and bottoms of bearing bars and cross bars in the same plane. Grating shall have a square mesh pattern providing bidirectional strength. Grating shall be reinforced with continuous rovings of equal number of layers in each direction. The top layer of reinforcement shall be no more than 1/8" below the top surface of the grating so as to provide maximum stiffness and prevent resin chipping of unreinforced surfaces. Percentage of glass (by weight) shall not exceed 35% so as to achieve maximum corrosion resistance, and as required to maintain the structural requirements of the Contract.
- B. After molding, no dry glass fibers shall be visible on any surface of bearing bars or cross bars. All bars shall be smooth and uniform with no evidence of fiber orientation irregularities, interlaminar voids, porosity, resin rich or resin starved areas.
- C. Non-slip surfacing: Grating shall be manufactured with a concave, meniscus profile on the top of each bar providing maximum slip resistance.
- D. Grating bar intersections are to be filleted to a minimum radius of 1/16" to eliminate local stress concentrations and the possibility of resin cracking at these locations.
- E. Fire rating: Grating shall be fire retardant with a tested flame spread rating of 25 or less when tested in accordance with ASTM E 84. Data performed only on the resin shall not be acceptable.
- F. Resin system: Manufacturer may be required to submit corrosion data from tests performed on actual grating products in standard chemical environments. Corrosion resistance data of the base resin from the manufacturer is not a true indicator of grating product corrosion resistance and shall not be accepted.
- G. Color: Gray
- H. Depth: 2" with a tolerance of plus or minus 1/16".
- I. Mesh Configuration: 2" x 2" with a tolerance of plus or minus 1/16" mesh centerline to centerline
- J. Load/Deflection: Grating design loads shall be less than manufacturers published maximum recommended loads. Maximum recommended loads shall be determined by

acoustic emission testing. Grating shall be designed for a uniform load of 100 psf or concentrated load of 300 lb. Deflection is not to exceed 1/4" or $L/D = 180$, whichever is less.

- K. The manufacturer shall certify that the stiffness of all panels manufactured are never more than 2.5% below the published load-deflection values.
- L. Substitutions: Other products of equal strength, stiffness, corrosion resistance and overall quality may be submitted with the proper supporting data to the engineer for approval.

2.06 GRATING FABRICATION

- A. Measurements: Grating supplied shall meet the dimensional requirements and tolerances as shown or specified. The Contractor shall provide and/or verify measurements in field for work fabricated to fit field conditions as required by grating manufacturer to complete the work. When field dimensions are not required, contractor shall determine correct size and locations of required holes or cutouts from field dimensions before grating fabrication.
- B. Layout: Each grating section shall be readily removable, except where indicated on drawings. Manufacturer to provide openings and holes where located on the contract drawings. Grating openings which fit around protrusions (pipes, cables, machinery, etc.) shall be discontinuous at approximately the centerline of opening so each section of grating is readily removable.
- C. Sealing: All shop fabricated grating cuts shall be coated with vinyl ester resin to provide maximum corrosion resistance. All field fabricated grating cuts shall be coated similarly by the contractor in accordance with the manufacturer's instructions.
- D. Hardware: Type 316 stainless steel hold down clips shall be provided and spaced at maximum of four feet apart with a minimum of four per piece of grating, or as recommended by the manufacturer.

PART 3 - EXECUTION

3.01 GENERAL

- A. It shall be the Contractor's responsibility to verify the actual locations (horizontal and vertical) of all utilities prior to beginning trench excavation. If utilities are to remain in place, provide protection from damage during construction operations.

3.02 EARTHWORK

- A. Excavation, bedding, and backfilling shall be as specified in Section 31 00 00, Earthwork, of these Specifications.

3.03 SURVEYS

- A. Layout of alignment and grade of site drainage piping shall be established by a Land Surveyor State licensed in Washington. Check the line and grade during installation to ensure that the Work is within the following allowable tolerances:
 - 1. Fine-grade and prepare bedding so the pipe can be initially placed with a variation from true line or grade, measured at each joint, of not more than 1/32 inch per inch diameter or 1/2 inch maximum, provided that:
 - a. A resulting level or backsloping length of pipe does not occur; and

- b. No more than one-half of the permissible variation shall be accumulated between successive joints.
- c. Pipe laid within these tolerances shall not be subjected to any further adjustment. Measurement for grade shall be taken at the pipe invert, NOT TOP OF PIPE. Eccentricity of pipe barrels, with respect to jointing surfaces, shall not produce grade interruption adverse to flow of more than 1/4 inch maximum.

3.04 INSTALLATION OF UNDERGROUND PIPE

- A. Contractor shall hold a pre-construction conference onsite with culvert manufacturer and Engineer a minimum of 2 weeks prior to beginning culvert installation.
- B. Furnish all necessary machinery for the work and pump, bail, or otherwise remove any water which accumulates in the trench. Perform all work necessary to keep the trench clear of water while the foundation and the masonry are being constructed or the pipe is being laid.
- C. Placing: Place the pipe from downstream to upstream with the bells pointing upstream in appropriate bedding graded to conform with the grades and alignment indicated on the Drawings and prepared as specified. Ensure that the pipe has a full, solid bearing along its entire length. Provide small depressions for pipe bells when utilized. Make minor adjustments to line and grade by scraping away, or filling in with, bedding material. Do not support pipes on blocks or mounds of any nature.
- D. Jointing: Take care to properly align the pipe and clean the bell and spigot or tongue of the pipe. Gaskets must be straight, properly lubricated and without twist. The pipe shall be partially supported by hand, sling, or crane, as required, to minimize lateral pressure on the gasket and to maintain concentricity until the pipe has been forced into final longitudinal position in accordance with the manufacturer's recommendations. Pipe handling, after the gasket has been affixed, shall be carefully controlled to avoid bumping the gasket and, thus, knocking it out of position or loading it with dirt or other foreign material. Gaskets so disturbed shall be removed, cleaned, relubricated and replaced before the joint is attempted.
- E. Apply sufficient restraint to the line to ensure that the joints, once home, are held so by tamping fill material under and alongside the pipe. At the end of the day's work, block the last pipe in such a manner as may be required to prevent creep during down time.

3.05 INSTALLATION OF MANHOLES AND CATCH BASINS

- A. Furnish all necessary labor, materials, or equipment to pump, bail, or otherwise dewater the trench or pit for the duration of the construction and backfill period.
- B. Manholes/Catch Basins
 - 1. Place manholes/catch basins at the elevation and location indicated on the Drawings upon the appropriate bedding prepared in accordance with Section 31 00 00 – "Earthwork".
 - 2. Carefully place precast manholes/catch basins on the quarry spall and structural fill bedding so as to be fully and uniformly supported in true alignment, making sure that all entering pipes can be inserted on proper grade.

3. All lift holes and all joints between precast elements shall be thoroughly wetted and then completely filled with mortar, smoothed and point both inside and out, to ensure watertightness.
 4. Place precast sections and align to provide vertical sides and vertical alignment of the ladder rungs. The completed catch basin shall be rigid, true to dimensions and watertight.
 5. In precast manhole/catch basin sections where steel loops have been provided in lieu of lift holes, remove the loops flush with the inside wall surface after the catch basin has been completed. No sharp cutoff protrusions will be permitted. If concrete spalling occurs as a result of the loop removal, restore the spalled area with mortar to a uniformly smooth surface.
- C. Grade Adjustment: The manhole/catch basin casting frame or casting ring may be either cast into a concrete collar or set flange down on pre-cast concrete adjustment rings and mortared, as directed by the Engineer. It shall not, in any case, be grouted to final grade until the final elevation of the pavement in which it is to be placed has been established and permission has been given by the Engineer to grout the casting in place. Provide not less than eight inches or more than 16 inches between the top of the cone or slab and the underside of the manhole casting ring for adjustment of the casting ring to grade. Bricks for grade adjustment shall not be used. Location of manholes/catch basins will be staked by the Contractor.
- D. Pipe Connections: Place all pipes entering or leaving the structure on firmly compacted bedding, particularly within the area of the structure excavation, which normally is deeper than that of the sewer trench. All openings in the walls of catch basins constructed with precast sections for the insertion of pipe connections and outlet trap castings shall, after pipe or castings have been placed to their final position, be grouted tight in place to present a smooth uniform surface inside and outside. Pipe placed through walls to which connections will be made shall be so placed that the socket end of the pipe is backed against the outside surface of the catch basin as closely as practicable for the angle of entrance. The spigot end of the pipe shall be cut square with the last point of contact with the inside wall surface. Provide flexible joints within 12 inches of the catch basin structure.
- E. Backfill: Hand-place backfill around the manhole, extending at least one pipe length into each trench and tamp with selected material up to an elevation of six inches above the crown of all entering pipes. Conform to the applicable provisions of Section 31 00 00 – “Earthwork”.

3.06 INSTALLATION OF INLINE CHECK VALVE

- A. Valve shall be installed in accordance with manufacturer’s written Installation and Operation Manual and approved submittals.
- B. Manufacturer’s authorized representative shall be available for customer service during installation and start-up, and to train personnel in the operation, maintenance and troubleshooting of the valve.

3.07 ACCEPTANCE TESTING

- A. After completion of the following, authorization from the Engineer shall be required before the Contractor can perform acceptance testing:
 1. Acceptable placement of applicable pipe, bedding, and backfill material.

2. Acceptable completion of all applicable manhole channels and grout work.
 3. Acceptable debris removal, cleaning, and flushing of all applicable pipes and structures.
- B. Contractor shall perform testing as required by Section 7-17.3 (2) Cleaning and Testing of the WSDOT Standard Specifications for Road Bridge and Municipal Construction, 2018 Edition. Infiltration Testing shall be required where the pipe is installed below the ground water table.
- C. Before final acceptance, the Contractor shall inspect all drainage lines by the use of a television camera, utilizing a Port approved independent inspection service company. The television inspection requirements shall include the provisions of:
1. A color analog/digital camera with pan and tilt capacity in order to view all main lines, lateral lines, and structures including channels.
 2. A dye solution to be introduced in sufficient quantity to travel from the structure that is the highest point of inspection to the downstream terminus of the inspection limits. Red or purple dye shall be used for PVC pipe and green dye for ductile iron and concrete pipe.
 3. A one-inch reference ball to be mounted to the camera in order to drag along the bottom of the pipe during the entire inspection procedure.
 4. Linear measure references to be measured from the center of the beginning structure to the center of the next inline structure and include the direction of flow. The locations of lateral pipes and all distinctive pipe conditions shall be referenced to the centerline of the beginning structure. All structure references shall utilize the designated structure reference numbers shown on the plans.
- D. The following television inspection information shall be provided to the Engineer:
1. A clear movie format on DVD which encompasses the limits of the inspection area and including all reference data as described herein. A tape reference time and date for the start of each run shall also be indicated.
 2. A written report shall be provided corresponding to the taped inspection and including all reference data as described herein. The report shall consist of a written narrative of all distinctive pipe conditions including ponding areas in excess of ¼ inch.

3.08 FRP GRATING INSTALLATION:

- A. Contractor shall install gratings in accordance with manufacturer's assembly drawings. Fasten grating panels securely in place with hold down fasteners as specified herein. Field cut and drill fiberglass reinforced plastic products with carbide or diamond tipped bits and blades. Seal cut or drilled surfaces in accordance with manufacturer's instructions. Follow manufacturer's instructions when cutting or drilling fiberglass products or using resin products; provide adequate ventilation.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

- A. The location and extent of the "Bioretention Systems" work is indicated on the drawings. The work includes the requirements for subgrade preparation and for furnishing and installing drain pipes, underdrain pipes and bedding, liners, amended soils, topsoil, seeding, catch basins, and river cobbles.

1.02 QUALITY ASSURANCE:

- A. Except as otherwise specified, the Port of Tacoma will provide testing and inspection service to the satisfaction of the Engineer. The Contractor may obtain test results from the office of the Resident Engineer at no cost. Tests conducted for the sole benefit of the Contractor, or before a product is approved, shall be at the Contractor's expense.
- B. Qualification of Workers: Employ at least one person who shall be present at all times during execution of this portion of the Work, shall be thoroughly familiar with the type of materials being installed and the best methods for their installation and shall direct all work performed under this section.
- C. Codes and Standards: Comply with the applicable provisions of all pertinent codes and regulations. References made herein for manufactured materials, such as pipe, fittings, manholes, catch basins and specialties refer to designations for American Association of State Highway and Transportation Officials (AASHTO) or to American Society for Testing Materials (ASTM).

1.03 SUBMITTALS:

- A. The Contractor shall submit the following information:
 - 1. Material Data:
 - 1) Materials Qualification Test: Submittal prepared by an independent soils testing laboratory to indicate the proposed Biofiltration Soil Mix (BSM) materials comply with contract document requirements. This test shall at a minimum include the following:
 - 2) Granlometric analysis (sand, silt, aggregate and compost) per weight.
 - 3) pH.
 - 4) Percentage of organic matter in soil.
 - 5) Determination of soluble salt content.
 - 6) Saturated hydraulic conductivity test per ASTM Designation D2434.
 - 2. List of plant species and/or seed mix and coverage ordered and received.
 - 3. One year warranty on vegetation from date of project completion.

4. Manufacturers or suppliers certifications for gravel backfill for drains underdrain pipes, streambed cobbles, crushed surfacing top course, and 80 mil HDPE liner.

PART 2 - PRODUCTS

2.01 BIOFILTRATION SOIL MIX:

- A. Biofiltration soil mix shall be a mix of soil including approximately 40% by volume compost and 60% by volume aggregate. Aggregates shall meet the following gradation requirements.

Sieve Size	Percent Passing
3/8"	100
#4	95 to 100
#10	75 to 90
#40	25 to 40
#100	4 to 10
#200	2 to 5

- B. Soil mix shall have 2% to 5% fines, a cation exchange capacity of at least 5 meq/100 grams of soil, 5% to 8% organic content, pH between 5.5 and 7, and an infiltration rate of 1 to 2.4 inches per hour.

2.02 Compost Mulch:

- A. Compost shall be a mature and stable humic soil amendment produced through the aerobic controlled decomposition of organic materials, shall be tested in accordance with the U.S. Composting Council's (USCC) Seal of Testing Assurance (STA) Program.
- B. Compost shall be wood chip mulch composed of shredded or chipper hardwood or softwood, free of weed seeds, soil, roots, and other material that is not trunk or branch wood and bark. Mulch shall not include grass clippings, mineral aggregate or pure bark.
- C. The compost component of amended soil shall be stable, mature, and derived from organic waste materials including yard debris, wood wastes and other organic matter. Compost must meet Washington State compost regulations in WAC 173-350 and must have an organic content of 35% to 65%, a carbon to nitrogen ration below 25:1.

- D. Compost shall be produced at a composting facility permitted by the WA Department of Ecology and be stable (low oxygen use and CO₂ generation) and capable of supporting plants and be tested accordance with the U.S. Composting Council Testing Methods for the Examination of Compost and Composting (TMECC) and be screened to the size gradations for fine compost under TMECC test method 02.02-B.
- E. Compost pH shall be between 6 and 8.5 (TMECC 04.11-A) with a manufactured inert content less than 1% by weight (TMECC 03.08- A).
- F. Mulch shall be screened to a maximum of 4-inch particle size and provide a uniform texture.
- G. Mulch is to be free from soil, fine organics, sawdust, foreign materials, and any artificially introduced chemical compounds detrimental to plant or animal life.

2.03 PLANT AND SEEDING MATERIALS:

- A. All plants shall conform to the standards of the current edition of American Standard for Nursery Stock as approved by the American Standards Institute, Inc.
- B. All plant materials shall have well developed branches and root systems free from physical defects, plant diseases, and pests.
- C. Seed shall be of the mix, species, and spread rate as indicated in the Drawings.

2.04 UNDERDRAIN PIPE:

- A. Underdrain pipe shall conforming to Specification Section 33 40 00 – Storm Drainage Utilities.

2.05 CLEANOUT

- A. Cleanouts shall be mounted firmly in place without yielding and be constructed as shown in the Drawings.

2.06 GEOTEXTILE FOR UNDERGROUND SEPARATION

- A. Geotextile shall be an High Density Polyethylene (HDPE) liner 80 mils thick minimum, and meeting or exceeding Geosynthetic Research Institute (GRI) Test Method GM-13. The liner shall have continuously fused seams and be watertight.

2.07 GRAVEL BACKFILL FOR DRAINS:

- A. Gravel backfill for drains shall be free draining material with the grading requirements according to WSDOT Standard Specifications Section 9- 03.12(4).

2.08 STREAMBED COBBLES:

- A. Cobbles shall be rounded rock with the grading requirements according to WSDOT Standard Specifications Section 9-03.11(2).

2.09 TOPSOIL

- A. Top soil shall be Type B meeting the requirements of WSDOT Standard Specifications, Section 8-02.3(4)B.

PART 3 - EXECUTION

3.01 EARTHWORK:

- A. Excavation, bedding, and backfilling shall be as specified in Section 31 00 00 - Earthwork and Section 31 23 33 – Trenching and Backfilling of these specifications.

3.02 BIORETENTION SOIL STORAGE, PLACEMENT PREPARATION AND PLACEMENT:

A. Storage:

1. Isolate bioretention area substrate from other soils. No pedestrian or vehicular traffic is to be permitted on the substrate. Protect the soils from water and air erosion.
2. Stockpile soil substrate generally where indicated and in such a manner that natural drainage is not obstructed and that no off-site sediment transmission will result. Place stockpiles with a maximum 2:1 side slope.

B. Preparation and Placement:

1. The subgrade in the bioretention area shall be scarified to a depth 6 inches below the subgrade (below the crushed surfacing top course and HDPE liner) and compacted to 95% of the maximum dry density. The subgrade shall be free and clear of any rocks, sticks, or sharp objects. Four inches of crushed surfacing base course shall be placed and compacted to 95% of the maximum dry density prior to placement of the HDPE liner.
2. Remove any debris and rock greater than one inch diameter from area where the substrate is to be placed.
3. After placement of the HDPE liner, the top layer of crushed surfacing top course shall be placed and hand tamped. The method used shall not puncture the liner.
4. Gravel Backfill for Drains and Biofiltration Soil Mix shall be placed in layers not to exceed 12 inches and lightly compacted to 80 to 85% of the maximum dry density (ASTM D 1557). No heavy equipment is allowed over the biofiltration matrix.

C. Plant Transportation and Installation:

1. Plant material root stock shall be kept moist during transport and on-site storage.
2. Planting is to be completed according to supplier's recommendations.
3. Plants are to be set and maintained vertical during installation.
4. Thoroughly water ground bed cover after installation.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

The location and extent of the "Storm Water Treatment" work is indicated on the Drawings. The work includes the requirements for furnishing and installing all items and components of a completed Storm Water Treatment System as follows:

- A. The Contractor shall furnish and install treatment vault systems, complete and operable as shown and as specified herein, in accordance with the requirements of the plans and contract documents.

Treatment vault systems shall consist of a precast concrete vault with internal baffle walls access lids and drainage grate, containing filtration media cages, perforated and solid piping.

1.02 QUALITY ASSURANCE

- A. Qualification of Workmen: Employ at least one person who shall be present at all times during execution of this portion of the work, shall have all portions of the Drawings and Specifications applicable to that portion of the contract, shall be thoroughly familiar with the type of materials being installed and the best methods for their installation, and shall direct all work performed under this Section.
- B. Codes and Standards: The Contractor shall comply with the applicable provisions of all pertinent codes and regulations. References made herein for manufactured materials such as pipes, fittings, and specialties refer to designations for the latest edition of materials published by the American Association of State Highway and Transportation Officials (AASHTO), the American Society for Testing Materials (ASTM), the American Public Works Association (APWA) Standard Specification for Municipal Public Works Construction, and the WSDOT/APWA 2004 Standard Specifications for Road, Bridge and Municipal Construction.
- C. The quality of materials, the process of manufacture, and the finished sections shall be subject to inspection by the Engineer. Such inspection may be made at the place of manufacture, or on the work site after delivery, or at both places, and the sections shall be subject to rejection at any time if material conditions fail to meet any of the specification requirements, even though sample sections may have been accepted as satisfactory at the place of manufacture. Sections rejected after delivery to the site shall be marked for identification and shall be removed from the site at once. All sections that have been damaged beyond repair during delivery will be rejected and, if already installed, shall be repaired to the Engineer's acceptance level, if permitted, or removed and replaced, entirely at the manufacturer's expense.
- D. Source Quality Control: Test import materials proposed for use to demonstrate that the materials conform to the specified requirements. Tests shall be performed by an independent accredited testing laboratory.
- E. Field Quality Control:

1. The Engineer will:
 - a. Review materials proposed for use.
 - b. Review results of independent testing laboratory tests.
 - c. Inspect the empty filtration basins prior to placement of any material.
 - d. Inspect all delivered filtration system media and materials prior to placement within the filtration basins.
 - e. Stop media delivery or placement if it is determined that the delivered media(s) do(es) not appear to match the submittals, and require sampling and testing of the delivered media before authorizing placement. If testing is required, the Contractor shall be required to demonstrate that the media in question meet the specifications of Part 2.
 - f. Inspect all media after mixing.
 - g. Observe placement.
- F. All filtration media shall be thoroughly mixed to a homogenous consistency before placement.
- G. All filtration media shall be tested prior to installation for infiltration rate compliance. A 48-inch diameter manhole or equivalent watertight container shall be filled 30 inches deep with the respective media and saturated. Installation of media shall be performed similar to the method defined in Part 3. The test will be performed until 1 hour after steady state head conditions have been achieved, and ponding depth shall not exceed 12 inches. This test shall be applied for each filtration media type, as defined in Part 2. If the media does not yield the infiltration rates as adjusted for the falling head test, the saturated media shall be removed, and additional media shall be added and retested.

For every 50 cubic yards of media to be installed in the treatment vaults, a falling head test shall be performed on a representative media sample. The final media installed in the filtration basins shall be from the same batch as the representative sample tested. The falling head tests shall be observed by the Engineer. The adjusted infiltration rates are as follows:

Filtration Media Mix - 12 in/hr adjusted to 24 in/hr

1.03 SUBMITTALS

- A. Shop and installation drawings shall include all dimensions, component placement, location of piping and vault foundation.
- B. Manufacturer's literature on the components within the treatment vaults, including components used for construction of media cages, piping, and media.
- C. Reports of results of required tests by an independent, accredited laboratory demonstrating material conformance to requirements of Part 2 at least 10 Working Days prior to placement of filtration media.

- D. Samples and Test Results: Furnish, without additional cost to the Port, such quantities of materials as may be required by the Engineer for test purposes. Cooperate with the Engineer and furnish necessary facilities for sampling and testing of all materials and workmanship. Submit test results for import materials. Tests shall be performed within 30 days of the submission. All material furnished and all work performed shall be subject to rigid inspection, and no material shall be delivered to the site until it has been favorably reviewed by the Engineer, or used in the construction work until it has been inspected in the field by the Engineer.
- E. A description of the equipment and methods used to mix filtration media.
- F. For biochar products other than the approved product identified in Section 2.01 C.7, the following shall be submitted to the Engineer for approval:
 - a. A copy of the producer's current Material Registration Certificate demonstrating compliance with the USDA National Organic Standards (7 CFR Part 205).
 - b. Reports from an accredited laboratory demonstrating that the biochar product meets all requirements of Section 2.01 C.
 - c. A description of the equipment and methods used to test Chemical Oxygen Demand (COD) removal capacity, as outlined in Section 2.01. C.8.
- G. The following information about the testing laboratory(ies):
 - a. Name of laboratory(ies) including contact person(s),
 - b. Address(es),
 - c. Phone contact(s),
 - d. E-mail address(es);
 - e. Qualifications of laboratory and personnel including date of current certification by STA, ASTM, AASHTO, or equal.
- H. The name and address of all suppliers of filtration media.
- I. If the source of any material changes, including compost stockpile, a new mix design must be submitted.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Protect all materials from damage during delivery and cover UV sensitive materials if materials will be stored for more than one week. Storage surfaces should be free from dirt, mud and debris.
- B. Media shall be stored separately from each other and all other materials.
- C. All media shall be protected from all sources of additional moisture, in covered conveyance at the site until incorporated into the work.

PART 2 - PRODUCTS

2.01 TREATMENT VAULT INTERNAL COMPONENTS

A. Media Cages:

1. Media cages shall be fabricated from fiberglass reinforced plastic (FRP) grating and slotted channel framing components, UNI-STRUT or approved equal.
2. All slotted channel framing components, including channels, brackets and fasteners, shall be supplied by a single approved manufacturer.
3. Slotted channel framing components shall be stainless steel conforming to ASTM A 240, Type 304, or aluminum conforming to ASTM B 221, Type 6063-T6.
4. Slotted channel fittings for stainless steel shall be fabricated in conformance with ASTM A 240 and ASTM A 276, Type 304 or Type 316.
5. Slotted channel fittings for aluminum shall be fabricated in conformance with ASTM B 209, Type 1100F or Type 5052-H32.

B. Pipe:

1. Pipe shall be perforated high density polyethylene (HDPE) pipe with conforming to the requirements of AASHTO M252/M294
2. Perforated pipe shall have circular perforations conforming to AASHTO M252/M294, Class 2.

2.02 PRECAST CONCRETE VAULT

- A. Pre-cast concrete vaults shall be provided according to ASTM C857 and C858. Loading criteria shall be as listed in Paragraph 1.04.
- B. Vault joint sealant shall be Conseal CS-101, A-Lok Butyl Lock or approved equal.
- C. If interior concrete baffle walls are provided, baffle walls shall be sealed to the interior vault walls and floor with a polyurethane construction sealant rated for use below the waterline, SikaFlex 1a, 3M 550 Polyurethane or approved equal. Contractor to provide sealant material and installation unless completed prior to shipment.
- D. Metal frame and grate or cover for catch basins and manholes shall be ductile iron of the size and style indicated on the Drawings and capable of supporting the maximum loading criteria listed in Paragraph 1.04.
- E. Steps shall be constructed of copolymer polypropylene conforming to ASTM D-4101. Steps shall be driven into preformed or drilled holes once concrete is cured. Steps shall meet the requirements of ASTM C-478 and AASHTO M199. The ½ -inch Grade 60 deformed reinforcing bar shall meet ASTM A-615.

- F. Ladders shall be constructed of aluminum and steel reinforced copolymer polypropylene conforming to ASTM D-4101. Ladder shall bolt in place. Ladder shall meet all ASTM C-497 load requirements. Ladders provided upon request or where required.

2.03 FILTRATION MEDIA MIX (FMM)

- A. Filtration Media Mix shall consist of a blend of pea gravel, oyster shells and biochar.
- B. Pea Gravel shall be as defined in Section 31 00 00 – Earthwork.
- C. Oyster Shells:
1. Oyster shells shall be crushed and ground evenly and shall meet the following gradation:

US Sieve Size	Percent Passing (%)
No. 10	100
No. 16	90-100
No. 100	< 5

D. Bio-Char:

1. Provide Black Owl Biochar Environmental Ultra as manufactured by Biochar Supreme or equal.
2. Biochar shall be the result of pyrolysis of 100% clean, unprocessed virgin wood waste.
3. Biochar shall be certified as an organic fertilizer soil amendment in accordance with the USDA National Organic Standards (7 CFR Part 205).
4. Biochar shall have a Butane Activity of at least 13 g/100g in accordance with ASTM D 5742, Standard Test Method for Determination of Butane Activity of Activated Carbon.
5. Biochar shall have a Total Ash content of less than 10% in accordance with ASTM D 1762-84 (750c).
6. Biochar shall have an Organic Carbon content of at least 75% in accordance with Carbon Hydrogen Nitrogen (CHN) by dry combustion test method.
7. Acceptable source for biochar is Biochar Supreme, Everson, WA or equal.

2.04 OTHER COMPONENTS

- A. All contractor-provided components shall meet the requirements of this section, the plans specifications and contract documents. In the case of conflict, the more stringent specification shall apply.
- B. Silicone Sealant shall be pure RTV silicone conforming to Federal Specification Number TT S001543A or TT S00230C or Engineer approved.
- C. Grout shall be non-shrink grout meeting the requirements of Corps of Engineers CRD-C588. Specimens molded, cured and tested in accordance with ASTM C-109 shall have minimum compressive strength of 6,200 psi. Grout shall not exhibit visible bleeding.

2.05 STORMFILTER CATCH BASINS

- A. The stormfilter stormwater treatment catch basin shall be of a type that has been installed and in use successfully for a minimum of five (5) or more years. The stormfilter stormwater treatment catch basin shall be supplied by CONTECH Construction Products Inc.

PART 3 - EXECUTION

3.01 GENERAL

It shall be the Contractor's responsibility to verify the actual locations (horizontal and vertical) of all utilities prior to beginning excavation. If utilities are to remain in place, provide protection from damage during construction operations.

3.02 EARTHWORK

Excavation, bedding, and backfilling shall be as specified in Section 31 00 00 – "Earthwork" of these Specifications.

3.03 PRECAST CONCRETE VAULTS AND CATCH BASINS

- A. Set pre-cast vaults and catch basins on aggregate base material that has been placed in maximum 12-inch lifts, loose thickness, and compacted to at least 95-percent of the maximum dry density as determined by the standard Proctor compaction test, ASTM D698, at moisture content of +/-2% of optimum water content.
- B. Inlet and outlet pipes shall be stubbed in and connected to pre-cast concrete vault shown on the drawings. If grout is used, Contractor to grout all inlet and outlet pipes flush with or protruding up to 2 inches into interior of vault.
- C. Catch basins shall be connected with no-hub stainless steel connectors and adapter fittings as necessary.

3.04 MEDIA INSTALLATION

- A. Grading or placement of aggregates or filtration media within the treatment vaults shall not begin until the area draining to the treatment vaults has been stabilized and authorization is given by the Engineer.
- B. Runoff shall not be allowed to enter the treatment vaults until authorization is given by the Engineer.
- C. Placement shall not occur if any of the media are wet. The Engineer will have final authority to determine if wet conditions exist.
- D. Mixing or placing filtration media shall not be allowed if the area receiving filtration media is wet or saturated or has been subjected to more than ½-inch of precipitation within 48-hours prior to mixing or placement. The Engineer will have final authority to determine if wet or saturated conditions exist.
- E. All filtration media shall be thoroughly mixed to a homogenous consistency before placement.
- F. Where shown on the Drawings, the Contractor shall place pea gravel to separate filtration media and drain rock in accordance with these Specifications and in conformity with the lines, grades, depth, and typical cross-section shown in the Drawings or as established by the Engineer prior to the placement filtration media. Ecology blocks required for pipe supports shall be placed after installation of drain rock layer, prior to installation of pea gravel and subsequent media.
- G. The Contractor shall place all media, using hand tools, unless otherwise approved by the Engineer.

3.05 STORMFILTER INSTALLATION

- A. Install Stormfilter catch basins in accordance with manufacturer's recommendations.

3.06 CLEAN UP

- A. All treatment vaults shall be free of any foreign materials including concrete and excess sealant.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. The oil-water separator system shall be housed within a rectangular, precast reinforced concrete vault. Within the precast concrete vault, parallel-corrugated plate coalescing media shall be utilized to provide enhanced gravity separation of oil and water mixtures. The separator shall include a baffled inlet compartment, separation chamber, and clean water outlet chamber.

1. INLET COMPARTMENT

- a. The inlet compartment shall be of sufficient volume to effectively reduce influent suspended solids, dissipate energy and begin separation. The inlet shall be comprised of a non-clog diffuser to distribute the flow across the width of the separation chamber. A sludge baffle will be provided to retain settleable solids and prevent sediment from entering the separation chamber. The forebay or inlet compartment shall be 1/3 the total length of the vault to meet regulatory requirements.

2. SEPARATION CHAMBER

- a. The oil separation chamber shall contain coalescing media. The parallel corrugated plates shall be at a 45° angle with respect to longitudinal axis of the plate corrugations, and spaced 1/2-inch apart for removal of free oil 60 microns in size or greater, and settleable solids. System configuration shall not promote solids buildup on the plates, which may increase velocities and result in the discharge of an effluent of unacceptable quality.
- b. Laminar flow with a Reynolds Number of less than 500 at the maximum designed flow rate shall be maintained throughout the coalescing media, including entrance and exit so as to prevent reentrainment of oils with water. Flow through the coalescing media shall be cross-flow perpendicular to plate corrugations so that the oil collects and coalesces at the high point of corrugations and rises to the top of the media pack without clogging.
- c. Minimum treatment flowrate capacity shall be 400 gpm for Oil Water Separator #1 and 350 gpm for Oil Water Separator #2.

3. CLEAN WATER OUTLET CHAMBER

- a. An oil retention baffle or inverted T-pipe section shall be provided to prevent free-floating oil from exiting the system.

4. PIPE CONNECTIONS

- a. Internal Inlet and Outlet pipe with sampling tee shall extend through vault wall with sealed penetration and connected to exterior piping system with a Fernco type coupling.

1.02 QUALITY ASSURANCE

- A. Except as otherwise specified, the Port of Tacoma will provide testing and inspection service to the satisfaction of the Engineer. The Contractor may obtain test results from the Engineer at no cost. Tests conducted for the sole benefit of the Contractor, or before a product is approved, shall be at the Contractor's expense.

1. Qualification of Workmen: Employ at least one person who shall be present at all times during execution of this portion of the work, shall have all portions of the Drawings and

Specifications applicable to that portion of the Contract, shall be thoroughly familiar with the type of materials being installed and the best methods for their installation, and shall direct all work performed under this Section.

2. Codes and Standards: The Contractor shall comply with the applicable provisions of all pertinent codes and regulations. References made herein for manufactured materials such as pipes, fittings, and specialties refer to designations for the latest edition of materials published by the American Association of State Highway and Transportation Officials (AASHTO), the American Society for Testing Materials (ASTM), and the Standard Specifications and Standard Plans for Road, Bridge, and Municipal Construction prepared jointly by the Washington State Department of Transportation (WSDOT) and the American Public Works Association (APWA).
3. The Contractor shall coordinate with and comply with the applicable provisions of all pertinent local codes and regulations from the City of Tacoma concerning testing, cleaning, installation, inspection and materials used.
4. The quality of materials, the process of manufacture, and the finished sections shall be subject to inspection by the Engineer. Such inspection may be made at the place of manufacture, or on the work site after delivery, or at both places, and the sections shall be subject to rejection at any time if material conditions fail to meet any of the specification requirements, even though sample sections may have been accepted as satisfactory at the place of manufacture. Sections rejected after delivery to the site shall be marked for identification and shall be removed from the site at once. All sections that have been damaged beyond repair during delivery will be rejected and, if already installed, shall be repaired to the Engineer's acceptance level, if permitted, or removed and replaced, entirely at the manufacturer's expense.
5. All sections shall be inspected for general appearance, dimensions, soundness, etc. The surface shall be dense, close-textured and free of blisters, cracks, roughness and exposure of reinforcement.
6. Imperfections may be repaired, subject to the acceptance of the Engineer, after demonstration by the manufacturer that strong and permanent repairs result. Repairs shall be carefully inspected before final acceptance. Cement mortar used for repairs shall have a minimum compressive strength of 4,000 psi at the end of 7 days and 5,000 psi at the end of 28 days when tested in 3-inch by 6-inch cylinders stored in the standard manner. Epoxy mortar may be utilized for repairs.

1.03 SUBMITTALS

- A. Submit the following in accordance with Section 01 33 00 - Submittal Procedures for the following products:
 1. Shop and installation drawings shall include all dimensions, location of piping, and vault foundation.
 2. Material cut sheets for coalescing media and sealants.
 3. Manufacturer's literature on the Oil-Water Separator treatment system that includes information on the performance and operation of the units, materials of construction, dimensions, hydraulic capacity calculations including flow and head-loss data.
 4. Submit copies of the Oil-Water Separator treatment system Operation and Maintenance manual to the Engineer as per Section 01 77 00 - Closeout Procedures.

PART 2 - PRODUCTS

2.01 MATERIALS AND DESIGN

- A. Concrete for the precast concrete vault shall conform to ASTM C 857 and C 858 and meet the following additional requirements:
 - 1. Sections shall have tongue-and-groove joints or shiplap joints and be sealed with a butyl mastic sealant designed to be resistant to fuel and oil such as ConSeal™ Brand CS-440 or approved equal.
 - 2. Cement shall be Type II Portland cement, or approved equal, conforming to ASTM C 150.
 - 3. All precast concrete sections shall be cured by an approved method. Sections shall not be shipped until the concrete has attained a compressive strength of 4,000 psi or until 5 days after fabrication and/or repair, whichever is longer.
- B. Coalescing media shall be manufactured by Facet International and be made of calcium carbonate filled polypropylene corrugated plates, with corrugation angles no less than 45° with respect to longitudinal axis of the plate corrugations. Plates shall be spaced at 1/2-inch intervals and be stacked and bound together with sturdy rods and supports to form modular plate packs.
- C. Polyurethane elastomeric sealant shall comply with ASTM 0-412 and GSA Specification TT-S-00230C, Type II, Class A and ASTM C-920, Type S, Grade NS.
- D. Metal frames and lids shall be ductile iron and capable of supporting the maximum loading criteria listed in Paragraph 1.04.
- E. Precast concrete rings used to build the casting frames to grade shall conform to ASTM C 32 or ASTM C 139 and shall be installed in conformance with all local requirements.

2.02 PERFORMANCE

- A. The oil-water separator systems, with the performance specifications as described below, shall remove essentially all free and dispersed, nonemulsified oil and settleable solids from an oil/water mixture at the specified flow rates and operating temperatures. The system design shall utilize the difference in specific gravity between oil and water (i.e., buoyancy force) to separate these fluids. The separation process shall be enhanced through the use of coalescing media. The separator shall be designed to receive non-emulsified oily water by gravity and shall process it on a once through basis.
- B. System Specifications:

Treatment Flow Rate	400 gpm min
Effluent Target Quality	15 mg/L at any time or 10 mg/l on a 24-hr average

2.03 MANUFACTURER

- A. The manufacturer of the oil-water separator system shall have been regularly engaged in the engineering design and production of systems for the physical treatment of stormwater runoff for a minimum of 5 years.
- B. The oil-water separator system shall be manufactured by Utility Vault, CONTECH Stormwater

Solutions, or approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Installer Qualifications: Engage an experienced Installer who has at least three years' experience and has completed at least five projects with same material and of similar scope to that indicated for this Project with a successful construction record of in-service performance.
- B. Each oil-water separator system shall be constructed according to the sizes shown on the Drawings and as specified herein. Install at elevations and locations shown on the Drawings or as otherwise directed by the Engineer.
- C. Place the precast base unit on a crushed stone subbase of minimum thickness of 12 inches after compaction or of greater thickness and compaction if specified elsewhere. The subbase shall be checked for level prior to setting and the precast base section of the trap shall be checked for level at all four corners after it is set. If the slope from any corner to any other corner exceeds 0.5% the base section shall be removed and the subbase material re-leveled.
- D. Prior to setting subsequent sections place mastic sealant, in conformance with ASTM C 990-91, along the construction joint in the section that is already in place in such a manner that no gaps or voids are present.
- E. After setting the precast roof section of the oil-water separator system, set precast concrete manhole riser sections, to the height required to bring the cast iron manhole covers to grade, so that the sections are vertical and in true alignment with a 1/4-inch maximum tolerance allowed. Backfill in a careful manner, bringing the fill up in 6-inch lifts on all sides. If leaks appear, clean the inside joints and caulk with lead wool to the satisfaction of the Engineer. Precast sections shall be set in a manner that will result in a watertight joint. In all instances, installation of the oil-water separator system shall conform to ASTM specification C 891 "Standard Practice for Installation of Underground Precast Utility Structures."
- F. Holes made in the concrete sections for handling or other purposes shall be plugged with a non-shrink grout or by using grout in combination with concrete plugs.

END OF SECTION