

**PORT OF TACOMA
TACOMA, WASHINGTON
TERMINAL 3 & TERMINAL 4 SHORE POWER
PROJECT**

**PROJECT NO. 201100.01
CONTRACT NO. 071357**

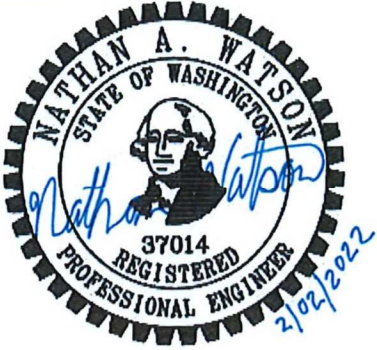


**Thais Howard, PE
Director, Engineering**

**Hughes Wike, PE
Project Manager**

END OF SECTION

The undersigned Engineer of Record hereby certifies that the Technical Specifications for the following portions of this project 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:

<u>SEAL & SIGNATURE</u>	<u>SECTION(S)</u>
	Divisions 2, 31 and 32, and Section 33 40 00
	Divisions 3, 5 and 9
	Divisions 26 and 27, and Sections 33 71 19, 33 77 00 and 33 79 00

END OF SECTION

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END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

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G2.3	Existing Environmental Conditions
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G3.2	Pier 3 Enlarged TESC Plan
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C3.10	Electrical Profiles
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E2.8	Below Pier Conduit Routing Elevations
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E3.3	Enlarged Electrical Plan - Pier 3 TPU Service Equipment
E3.4	Enlarged Electrical Demolition Plan Substation - Pier 4
E3.5	Enlarged Electrical Construction Plan Substation - Pier 4
E3.6	Enlarged Electrical Construction Plan Substation - Pier 4
E4.1	Pier 3 Conduit and Conductor Schedule
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E6.1	Electrical Details
E6.2	Pier 3 Shore Power Control Wiring
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E6.4	Ductbank Sections
E7.1	Enlarged Electrical Plan Substation - Pier 3 Grounding
E7.2	Enlarged Electrical Plan Substation - Pier 4 Grounding
E7.3	Grounding Installation Details
S1.1	Structural Notes
S2.1	Plan - Shore Power Vaults SSB0, SSB1 and SSB2 on Pier 3
S2.2	Plan - Shore Power Vaults SSB3, SSB4 and SSB5 on Pier 4
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S2.7	Plan - Vault Wall at SSB5
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S4.1	Electrical Equipment Pad
S5.1	Under Wharf Conduit Support Details - Sheet 1
S5.2	Under Wharf Conduit Support Details - Sheet 2
S5.3	Under Wharf Conduit Support Details - Sheet 3
S5.4	Under Wharf Conduit Support Details - Sheet 4

Sheet No.	Drawing Title
S5.5	Under Wharf Conduit Support Details - Sheet 5
S6.1	Plan - New Shore Power Vault on Pier 3
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END OF SECTION

TERMINAL 3 & TERMINAL 4 SHORE POWER PROJECT

PROJECT NO. 201100.01 | CONTRACT NO. 071357

Scope of Work:

The Work required for this Project includes:

Installation of medium voltage (13.8kV to 6.6kV) electrical shore to ship power systems for the Terminal 3 and Terminal 4 vessel berths including substations and equipment such as transformers, switchgear assemblies, walk-in enclosures (including shore power switches, relays, controls, metering, status indications, and interlocks), power factor correction capacitors in enclosures, and 7.2kV shore power receptacles. Work includes installation of one new shore power vault on Pier 3 bullrail, wharf modification and trenching work, coordination with Tacoma Power for power switch and revenue metering installation, acceptance testing, and vessel commissioning.

The Port has been awarded Environmental Protection Agency (EPA), State of Washington Department of Ecology (Ecology), and TransAlta Grants for the work. Pursuant to 40 CFR, Section 33.301, the prime contractor shall make good faith efforts to award subcontracts to the fullest extent practicable to Disadvantaged Business Enterprises (DBEs). The winning contractor shall maintain all records documenting good faith efforts and provide to the Port when requested. See Section 00 72 00, Article 5.02 for additional detail.

Bid Estimate:

Estimated cost range is \$7,463,000 to \$8,641,000, plus Washington State Sales Tax (WSST).

In accordance with RCW 39.04.320, fifteen (15) percent apprenticeship participation is required for certain projects estimated to cost one million (\$1,000,000) dollars or more. Bidders may contact the Department of Labor and Industries, Specialty Compliance Services Division, Apprenticeship Section, P.O. Box 44530, Olympia, WA 98504-4530, by phone (360) 902-5320, or e-mail at Apprentice@lni.wa.gov, to obtain information on available apprenticeship programs.

**Sealed Bid Date/
Time/Location:**

Bids will be received at the Front Reception Desk, Port Administration Office, One Sitcum Plaza, Tacoma, Washington 98421 until **2:00 P.M. on March 22, 2022**, at which time they will be publicly opened and read aloud and the apparent low bid will be determined.

**Pre-Bid
Conference and
Site Tour:**

A pre-Bid conference and site visit have been set for 3/02/2022 at 11:30am. The site visit will convene at the Port's Administrative building, located at One Sitcum Plaza, and will travel to the site after a brief meeting. The following Personal Protective Equipment is required for the site visit: sturdy shoes, reflective vest, and hardhat.

Due to the current COVID-19 concerns, there will be no carpooling personnel in Port vehicles during the site visit. Contractors will be escorted in their own vehicles on the terminal. Everyone attending must bring identification.

Attendees will be required to sign a Release and Acceptance of Responsibility and Acknowledgement of Risks Form prior to entering the site and shall provide their own Personal Protection Equipment (PPE) as required above.

Bid Security: Each Bid must be accompanied by a Bid security in an amount equal to five (5) percent of the Base Bid in a form allowed by the Instructions to Bidders.

Contact Information: Any questions to the Port may be emailed to procurement@portoftacoma.com. No oral responses will be binding by the Port. Questions will not be accepted after close of business (COB) on March 9, 2022.

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 071357. 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 Section 00 21 00 - Instructions to Bidders.

Public Works Training Requirements: Effective July 1, 2019, all businesses are required to have training before bidding on public works projects and prevailing wage under RCW 39.04.359 and RCW 39.12, or is on the list of exempt businesses maintained by the Department of Labor and Industries. The bidder must designate a person or persons to be trained on these requirements. The training will be provided by the Department of Labor and Industries or by a training provider whose curriculum is approved by the Department of Labor and Industries.

Please refer to Labor and Industries' web site (https://www.lni.wa.gov/TradesLicensing/PrevWage/Contractors/Training.asp?utm_medium=email&utm_source=govdelivery) for more information and training dates, requirements, and exemptions. Failure to attend this training could result in a determination of "not responsible" and the bidder not being awarded a public works contract.

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 "Apprentice" is a worker for whom an apprenticeship agreement has been registered and approved by the Washington State Apprenticeship and Training Council (RCW 49.04 and WAC 296-05).
- C. "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 their Bid and intent to enter into a Contract with the Bidder.
- D. The "Award Requirements" include the statutory requirements as a condition precedent to Award.
- E. 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.
- F. 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.
- G. 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.
- H. 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.
- I. A "Bidder" is a person or entity who submits a Bid.
- J. The "Bidding Documents" include the Advertisement or Invitation to Bid, Instructions to Bidders, the Bid Form, any other sample bidding and contract forms, including those provided by reference, the Bid security, and the proposed Contract Documents, including any Addenda issued prior to the Bid Date.
- K. 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.
- L. 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 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, 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, 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 that may 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 to fully 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. The Bidders and Sub-Bidders are registered and hold all licenses 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. CERTIFICATION. The Bidder verifies under penalty of perjury that the Bidder has not have been determined by a final and binding citation and notice of assessment issued by the Department of Labor and Industries or through a civil judgment entered by a court of limited or general jurisdiction to have willfully violated, as defined in RCW 49.48.082, any provision of Chapters 49.46, 49.48, or 49.52 RCW within the three (3) year period immediately preceding the Bid Date.
- I. 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.

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 component 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. No Conditions. The Bidder shall make no conditions or stipulations on the Bid Form, nor qualify its Bid in any manner.
7. 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

8. 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 due on the Base Bid. 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 due 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 projects equal to or greater than \$1,000,000, 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 (2) 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 twenty-four (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. MWBE, Veteran-owned, and 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 MWBE firms certified by the Office of Minority and Women's Business Enterprises (OMWBE), Veteran-owned businesses (defined in RCW 43.60.010, and Small, Mini and Micro business enterprises (defined in RCW 39.26.010).

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 (5) percent 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. Failure of the Bidder to provide Bid Security as required shall render the bid non-responsive.
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 an A.M. Best rating of "A-," Fiscal Size Category (FSC) six (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, (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 whose 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 un-forfeited 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, 1 Sitcum Plaza, Tacoma, WA 98421.
 - b. If a Bid is delivered, it shall be delivered to the Front Reception Desk, Port of Tacoma, 1 Sitcum Plaza, Tacoma, WA 98421.
 - c. The time stamp clock at the Front Reception Desk at 1 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 ninety (90) 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 twenty-four (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 twenty-four (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. 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 other required documents (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. The apparent low Bidder shall submit to the Port upon request:
 - 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 (10) percent 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-Bidder, 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: (a) withdraw their Bid, (b) 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 (c) 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 fifteen (15) 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. Bonds shall be written for one hundred (100) percent of the contract award amount, plus Washington State Sales Tax and Change Orders. The cost of such bonds shall be included in the Base Bid.

1. On contracts of one hundred fifty thousand dollars (\$150,000) or less, at the option of the Contractor or the General Contractor/Construction Manager as defined in RCW 39.10.210, the Port may, in lieu of the bond, retain ten (10) percent of the contract amount for a period of thirty days after date of final acceptance, or until receipt of all necessary releases from the department of revenue, the employment security department, and the department of labor and industries and settlement of any liens filed under RCW 60.28, whichever is later. The recovery of unpaid wages and benefits must be the first priority for any actions filed against retainage held by a state agency or authorized local government.
 2. On contracts of one hundred fifty thousand dollars (\$150,000) or less, the Port may accept a full payment and performance bond from an individual surety or sureties.
- 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. The successful Bidder shall deliver 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 fifteen (15) 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 SUMMARY

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

1.02 DEFINITIONS/CLARIFICATIONS

- 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, 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," "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.

1.03 SUBMITTALS

- A. Substitution Request Form. Use copy of form located at the end of this Section.
- B. Pre-Bid Substitution Requests. Submit one (1) PDF of the Substitution Request Form along with all supporting documentation for consideration of each request. Identify product, fabrication, or installation method to be replaced. Include Drawing numbers and titles. Substitution requests prior to the Bid Date may originate directly from a prime Bidder, or from a prospective Sub-Bidder.
 - 1. Documentation. Show compliance with requirements for substitutions with the following, as applicable:
 - a. Statement indicating why specified product, 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, 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 the Project.
 - 2. Engineer's Action. Engineer will review substitution requests if received electronically to procurement@portoftacoma.com at least seven (7) days prior to the Bid Date. 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 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.
- C. Post-Award Substitution Requests must be submitted by the Contractor and not a Subcontractor nor Supplier.
1. 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 applicable architect, engineer, and owner.
 - 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 the Project.
 - j. Comparison of the approved Baseline Project 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.
 2. Engineer's Action. If necessary, Engineer will request additional information or documentation for evaluation within seven (7) calendar days of receipt of a request for substitution. Engineer will notify Contractor through Port of acceptance or rejection of proposed substitution within fifteen (15) calendar days of receipt of request, or seven (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.
3. Substitutions for Cause. Submit requests for substitution immediately upon discovery of need for change, but not later than fourteen (14) days prior to date required for preparation and review of related submittals.
 - a. Conditions. Engineer will consider Contractor's request for substitution when the following conditions are satisfied:
 - 1) Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - 2) Requested substitution will not adversely affect the Baseline Project Schedule.
 - 3) Requested substitution has received necessary approvals of authorities having jurisdiction.
 - 4) Requested substitution is compatible with other portions of the Work.
 - 5) Requested substitution has been coordinated with other portions of the Work.
 - 6) Requested substitution provides specified warranty.
 - 7) If requested substitution involves more than one (1) 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.
 4. Substitutions for Convenience. Engineer will consider Contractor's requests for substitution if received within fourteen (14) days after the Notice of Award.
 - a. Conditions. Engineer will consider Contractor's request for substitution when the following conditions are satisfied:
 - 1) 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.
 - 2) Requested substitution does not require extensive revisions to the Contract Documents.
 - 3) Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - 4) Requested substitution will not adversely affect the Baseline Project Schedule.
 - 5) Requested substitution has received necessary approvals of authorities having jurisdiction.
 - 6) Requested substitution is compatible with other portions of the Work.
 - 7) Requested substitution has been coordinated with other portions of the Work.
 - 8) Requested substitution provides specified warranty.
 - 9) If requested substitution involves more than one (1) 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.

D. 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.

1.04 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

PROJECT TITLE: Terminal 3 & Terminal 4 Shore Power Project **PROJECT NO.:**
201100.01

SUBMITTED BY: _____ CONTRACT NO.: 071357
PRIME/SUB/SUPPLIER: _____ DATE: _____

Specification Title: _____ Section No.: _____
Description: _____ Paragraph: _____
Page No.: _____

Proposed Substitution: _____
Trade Name: _____ Model No.: _____
Manufacturer: _____
Address: _____ Phone No.: _____
Installer: _____
Address: _____ Phone No.: _____
Differences between proposed substitution and specified product: _____

Point-by-Point comparative data attached - REQUIRED

Reason for not providing specified item: _____

Similar Installation:
Project: _____ A/E: _____
Address: _____
Owner: _____ Date Installed: _____
Proposed substitution affects other parts of Work: No Yes; explain _____

Supporting Data Attached:
 Drawings Product Data Samples Tests Reports Other: _____

Applicable to Substitution Requests During Construction:
Proposed to Port for accepting substitution: \$ _____
Proposed substitution changes Contract Time: No Yes [Add] [Deduct] _____ # days.

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 Baseline Project Schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- 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.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted By: _____
Signed By: _____ Firm: _____
Address: _____

Telephone: _____ Email: _____
Attachments: _____

A/E's REVIEW AND RECOMMENDATION

- Approved Substitution
- Approved Substitution as Noted
- Reject Substitution - Use specified materials.
- Substitution Request received too late - Use specified materials.

Signed by: _____ Date: _____

ENGINEER'S REVIEW AND ACTION

- Substitution Approved - Make submittals in accordance with this Specification Section. If during construction, prepare Change Order.
- Substitution Approved as Noted - Make submittals in accordance with this Specification Section. If during construction, prepare Change Order.
- Substitution Rejected - Use specified materials.
- Substitution Request received too late - Use specified materials.

Signed by: _____ Date: _____

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 online at www.portoftacoma.com, but will not be part of the Contract Documents.
- B. Historical Reference Documents
 - 1. Entitled Pier 3 Upgrade Project Record Drawings, dated July 17, 2013.
 - 2. Entitled Pier 4 Phase 2 Reconfiguration Project Record Drawings, dated July 16, 2018.
 - 3. Entitled Hylebos Waterway Cleanup and Slip 1 Nearshore Confined Disposal Facility Project Drawings, dated January 22, 2003.
 - 4. Entitled Operations, Monitoring, and Maintenance Plan - Mouth of Hylebos Waterway (Segments 3, 4, and 5), dated October 2015.
- C. Geotechnical Report
 - 1. Entitled Geotechnical Engineering Services Report – Port of Tacoma Terminal 3 and Terminal 4 Shore Power Upgrades, dated October 26, 2021.
 - a. This report identifies properties of below grade conditions and offers recommendations for the design of foundations, prepared primarily for the use of Engineer.
 - b. The recommendations described shall not be construed as a requirement of this Contract, unless specifically referenced in the Contract Documents.
 - c. This report, by its nature, cannot reveal all conditions that exist on the site. Should subsurface conditions be found to vary substantially from this report, changes in the design and construction of foundations will be made, with resulting credits or expenditures to the Contract Price accruing to the Port.

1.02 AVAILABILITY

- A. Reference Documents are available online 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. The Port is reasonably certain that asbestos and lead will not be disturbed by the project. If the Contractor encounters material suspected of containing lead or asbestos which will interfere with the execution of the work, the Contractor shall stop work and notify the Engineer.
- B. Anticipate the presence of potentially contaminated material within the footprint of the Slip 1 Nearshore Confined Disposal (NCD) facility at varying depths below the primary containment cap.
 - 1. Refer to Section 00 31 00 - Available Project Information for relevant reference documents.
 - 2. Refer to Section 01 74 16 - Soil Characteristics and Waste Management and Section 31 00 00 - Earthwork for characterization, handling, and disposal requirements.
 - 3. Due to the relatively shallow depth of typical trenching activities, and the design depth of the primary containment cap according to the reference drawings, exposure of the capped contaminated materials is not expected for those and similar-depth activities.
 - 4. Contractor may encounter contaminated materials when excavating for vault installation within the footprint of the Slip 1 NCD facility at varying depths below the primary containment cap.

1.03 NOTIFICATION AND SUSPENSION

- A. If other material suspected of containing lead or asbestos, which will interfere with the execution of the work, is encountered, immediately notify the Engineer.
- B. If necessary, the Engineer will notify the relevant governmental and regulatory agencies. Depending upon the type of potentially hazardous materials identified, the Engineer may suspend work in the vicinity of the hazardous materials under the provisions of General Conditions 00 72 00, Paragraph 9.01.
- C. Following completion of any further assessment and testing to determine the nature of the materials involved, the Engineer will determine how the potentially hazardous material shall be managed. Although the actual procedures used in resuming the work shall depend upon the nature and extent of the potentially hazardous material, the following alternate methods of operation are 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 Engineer 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

BIDDER'S NAME: _____

PROJECT TITLE: TERMINAL 3 & TERMINAL 4 SHORE POWER PROJECT

The undersigned Bidder declares that it has read the Contract Documents (including documents provided by reference), understands the conditions under which the Work will be performed, has examined the Project site, and has determined for itself all situations affecting the Work herein Bid upon. Bidder proposes and agrees, if this Bid is accepted, to provide at Bidder's own expense, all labor, machinery, tools, materials, etc., including all Work incidental to, or described or implied as incidental to such items, according to the Contract Documents, and that the Bidder will complete the Work within the time stated, and that Bidder will accept in full the lump sum or unit price(s) set forth below:

ITEM NO.	DESCRIPTION OF ITEM	QTY	UOM	UNIT PRICE	EXTENDED PRICE (QTY. x UNIT PRICE)
1	Mobilization and Demobilization	1	LS		
2	Project Administration	1	LS		
3	Soil Handling, Stockpiling, and Disposal	1127	TON		
4	Pier 3 Bullrail Vault SSB0 Construction & Under Wharf Conduit Installation	1	LS		
5	Terminal 3 Shore Power System	1	LS		
6	Terminal 4 Shore Power System	1	LS		
7	Asphalt Paving	504	TON		
8	Commissioning with Vessel	1	LS		
9	All Other Work	1	LS		
10	Unforeseen Conditions Allowance	1	LS	\$25,000	\$25,000
TAXABLE BASE BID SUBTOTAL					

TOTAL BID AMOUNT	
10.3% WASHINGTON STATE SALES TAX (WSST) ON BASE BID SUBTOTAL	
BID TOTAL (WITH WSST)	

Note: Show prices in figures only.

Evaluation of Bids. In accordance with the provisions of the Contract Documents, Bids will be evaluated to determine the lowest Base Bid Subtotal offered by a responsible Bidder submitting a responsive Bid.

Trench Excavation Safety Provision. If the bid amount contains work which requires trenching exceeding a depth of four (4) feet, all costs for trench safety shall be included in the Base Bid and indicated below for adequate trench safety systems in compliance with RCW 39.04 and WAC 296-155-650. Bidder shall include a lump sum amount, excluding Washington State Sales Tax. If trench excavation safety provisions do not pertain to the Work, the Bidder should enter "N.A." or "Not Applicable" in the blank below.

Trench Excavation Safety: _____ (Total in Written Figures Only)

Principal Subcontractors/Suppliers. For Bids greater than one million (\$1,000,000) dollars, the Bidder shall list below the name of each subcontractor or supplier to whom the Bidder proposes to subcontract the portions of the work listed below, or name itself for the work.

Work to be Performed	Name of Firm
HVAC (Heating, Ventilation and Air Conditioning) Work	
Plumbing Work as described in RCW 18.106	
Electrical Work as described in RCW 19.28	

Non-Collusion Representation. The Bidder declares under penalty of perjury that the Bid submitted is genuine and not a sham or collusive bid, or made in the interest or on behalf of any person or firm not therein named; and further represents that the Bidder has not directly or indirectly induced or solicited any other bidder to submit a sham bid, or encouraged any other person or corporation to refrain from bidding; and that the Bidder has not in any manner sought by collusion to secure to the Bidder an advantage over any other bidder or bidders.

RCW 39.04.350 Certification. The Bidder represents and certifies, under penalty of perjury, that within the three- (3-) year period immediately preceding the Bid Date, the Bidder has not been determined by a final and binding citation and notice of assessment issued by the Department of Labor and Industries, nor through a civil judgment entered by a court of limited or general jurisdiction, to have willfully violated, as defined in RCW 49.48.082, any provision of Chapters 49.46, 49.48, nor 49.52 RCW.

Addenda. Bidder acknowledges receipt and acceptance of all Addenda through No. ____ (Identify Last Addenda By Number)

Bid Security. A certified check, cashier's check, or other obligation of a bank, or a bid bond in substantially the form set forth in Section 00 43 13, Bid Security Form for at least five (5) percent of the Base Bid Subtotal, shall be submitted with this Bid.

Apprenticeship Requirements. For Bids greater than one million (\$1,000,000) dollars, the apprentice labor hours required for this project are fifteen (15) percent of the total labor hours. The Bidder agrees to utilize this level of apprentice participation.

Name of Firm

Date

Signature

By Title

Mailing Address

City, State Zip Code

Telephone Number

Email Address

WA State Contractor's License No.

Employment Security Department No.

Identification of Bidder as a sole proprietor, a partnership, a joint venture, a corporation, or another described form of legal entity

END OF SECTION

KNOW ALL MEN BY THESE PRESENTS:

That we, _____, as Principal, and _____, as Surety, are held and firmly bound unto the PORT OF TACOMA as Obligee, 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 Obligee 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 Obligee 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 Obligee; or, if the principal shall, in case of failure to do so, pay and forfeit to the Obligee 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 Obligee, 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

THIS IS NOT TO BE SUBMITTED WITH A BID.

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.**

BIDDER'S COMPANY NAME: _____

For the below Mandatory Bidder Responsibility Criteria, please mark the appropriate choice.

1.01 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?

****Attach** letter dated within six (6) months of Bid Date.*

**Request a letter electronically by clicking on the following link <https://fortress.wa.gov/esd/twt/pwcinternet/> or by emailing a request to publicworks@esd.wa.gov.*

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 (1) 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
9. Has the Bidder ever been found to have willfully violated, as defined in RCW 49.48.082, any provision of Chapters 49.46, 49.48, or 49.52 RCW within the three- (3-) year period immediately preceding the date of this bid solicitation?
 Yes No
10. Has the Bidder completed the training required by RCW 39.04.350, or is the Bidder on the list of exempt businesses maintained by the Department of Labor and Industries?
 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 1.02. **Provide attached to this completed form documentation to confirm responsibility criteria.**

For remaining criteria below, check or fill-out the appropriate item. 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.

1.02 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 five (5) years?
 Yes, **If YES, explain below.** No

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 five (5) years?
 Yes, **If YES, explain below.** No

3. Have the Bidder and major Sub-Bidders been in bankruptcy, reorganization, and/or receivership on any public works project in the last five (5) years?
 Yes, **If YES, explain below.** No

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 five (5) years?

- Yes, **If YES, explain below.** No

5. Are the Bidder and major Sub-Bidders currently a party to a formal dispute resolution process with the Port (i.e., a pending mediation, arbitration, or litigation)?

- Yes, **If YES, explain below.** No

1.03 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.

1.04 WORK PERFORMED BY BIDDER

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

_____ %

1.05 ADDITIONAL CONTRACTOR INFORMATION

- A. As part of completing this Responsibility Detail Form, **submit the following information with the completed Responsibility Detail Form:**
 - 1. Bidder’s recent job resume, including a list of similar projects performed and contact information for the similar project owner(s), a brief description of work, start and end dates, and contract amount.
 - 2. Resumes of Bidder’s proposed project manager and job superintendent.
- B. 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.

- C. The Bidder shall submit this completed, **SIGNED** Responsibility Detail Form electronically (PDF), with all requested backup documentation, via email to the contact(s) noted on the Low Responsive Bidder Selection Notification.
- D. The Bidder and its subcontractors to verify that its subcontractors at each tier meet the responsibility criteria as required by RCW 39.06.020 and 39.04.350.
 - 1. Bidder shall verify major subcontractors meet the responsibility criteria required. Fill out one Port of Tacoma Public Works Project Bidder Evaluation Checklist for Subcontractors for each major subcontractor and submit to the Port with this form. Backup documentation is not required to be submitted.

PROJECT: Terminal 3 & Terminal 4 Shore Power Project

PROJECT NO.: 201100.01

CONTRACT NO.: 071357

Responsibility Certification Form

The Low responsive Bidder shall complete the Responsibility Detail Form, attach all documentation, and submit to the Port within twenty-four (24) hours following receipt of the Low Responsive Bidder Selection Notification. All forms shall be submitted electronically (PDF) via email to the contact(s) listed on the Selection Notice. Note, the same project may be used to demonstrate experience across multiple categories if applicable.

By completing and signing this Responsibility Detail Form, the Bidder is certifying that the information contained within the Form, the backup documentation, and any additional information requested by the Port is true and complete. The Bidder's failure to disclose the required information or the submittal of false or misleading information may result in the rejection of the Bidder's Bid, revocation of award, or contract termination.

The information provided herein is true and complete.

Signature of Authorized Representative

Date

Print Name and Title

**PORT OF TACOMA PUBLIC WORKS PROJECT BIDDER EVALUATION CHECKLIST FOR
 SUBCONTRACTORS**

PROJECT TITLE: Terminal 3 & Terminal 4 Shore Power Project

BIDDER: _____

CONTRACT AND PROJECT NUMBER: 071357/ 201100.01

This checklist shall be completed by the Bidder and its subcontractors to verify that its subcontractors at each tier meet the responsibility criteria as required by RCW 39.06.020 and RCW 39.04.350.

This checklist should be submitted to the Port of Tacoma Contracts Administrator within twenty-four (24) hours of request.

Document verification information or backup data is not to be submitted to the Port, this information should remain on file with the Contractor and be presented to the Port if requested at a later date.

Item No.	Item	Initials/Comments
1.	At the time of Bid submittal, have a certificate of registration in compliance with RCW 18.27: Check the L&I site https://fortress.wa.gov/lni/bbip/ . Verify that a subcontractor has an electrical contractor license, if required by RCW 19.28, or an elevator contractor license, if required by RCW 70.87.	
2.	While reviewing registration information above, also check contractor's Employer Liability Certificate to verify workers' comp (industrial insurance) premium status – current account. Complete a "Submit Contractor Tracking Request" to be notified if the contractor fails to pay workers' comp premiums or renew their contractor registration or if their electrical contractor license is suspended or revoked within one year.	
3.	State excise tax registration number (Department of Revenue). (contractor's Washington State Unified Business Identifier and tax registration number) http://dor.wa.gov/content/doingbusiness/registermybusiness/brd/ .	
4.	Not disqualified from bidding on any public works contract under RCW 39.06.010 or RCW 39.12.065(3). Check the Department of Labor and Industries http://www.lni.wa.gov/TradesLicensing/PrevWage/AwardingAgencies/DebarredContractors/ .	
5.	Verify subcontractors are registered with the Washington State Employment Security Department (ESD) and have an account number. Request a letter to be sent from the subcontractor electronically by clicking on the following link https://fortress.wa.gov/esd/twt/pwcinternet/ or by emailing a request to publicworks@esd.wa.gov . Include ESD#, UBI#, and business name in the email. Certificate of Coverage letter issued/dated within the last six (6) months.	

Item No.	Item	Initials/ Comments
	Document if subcontractor confirms in writing, under penalty of perjury, that it has no employees and this requirement does not apply.	

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" is: _____ (Legal Name)

_____ (Address)

_____ (Address 2)

_____ (Phone No.)

The "Project" is: Terminal 3 & Terminal 4 Shore Power Project (Title)

201100.01 | 071357 (Project/Contract No.)

1101 Port of Tacoma Road (Project Address)

Tacoma, WA 98421 (Project Address 2)

The "Engineer" is: Thais Howard, PE (Engineer)

Director of Engineering (Title)

thoward@portoftacoma.com (Email)

(253) 888-4718 (Phone No.)

The "Contractor's Representative" is: _____ (Representative)

_____ (Title)

_____ (Email)

_____ (Phone No.)

BACKGROUND AND REPRESENTATIONS:

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 for the Project 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 of execution of the Contract.

3.0 CONTRACT TIME AND LIQUIDATED DAMAGES

The Contractor shall achieve all interim milestones as set forth in the Contract Documents and Substantial Completion of the entire Work not later than 570 calendar days from execution of the Contract, subject to adjustments of this Contract Time as provided in the Contract Documents. The Contractor shall achieve Final Completion of the entire 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 reasonable and not penalties individually nor cumulatively.

The liquidated damages for failure to achieve Substantial Completion by the required date shall be \$1000 per calendar day. After the required Final Completion date, the liquidated damages for failure to achieve Final Completion shall be \$350 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, cumulatively if applicable, for each and every calendar day that Substantial Completion and/or Final Completion of the Work is delayed beyond the required 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.

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

CONTRACTOR

PORT OF TACOMA

By: _____

By: _____

Title: _____

Title: _____

Date: _____

Execution _____

Date:

END OF SECTION

PERFORMANCE BOND # _____

CONTRACTOR (NAME AND ADDRESS)

SURETY (NAME AND PRINCIPLE PLACE OF BUSINESS)

OWNER (NAME AND ADDRESS)

AGENT OR BROKER (FOR INFORMATION ONLY)

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

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 shall execute an agreement with the Port for Terminal 3 & Terminal 4 Shore Power Project, Project No. 201100.01/Contract No. 071357, 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 RCW 39.08.

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 and/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, attorney's 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 (6)" or higher, 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

Printed Name and Title

Printed Name and Title

Power of Attorney attached.

END OF SECTION

LABOR AND MATERIAL PAYMENT BOND # _____

CONTRACTOR (NAME AND ADDRESS)

SURETY (NAME AND PRINCIPLE PLACE OF BUSINESS)

OWNER (NAME AND ADDRESS)

AGENT OR BROKER (FOR INFORMATION ONLY)

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

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 shall execute an agreement with the Port for Terminal 3 & Terminal 4 Shore Power Project, Project No. 201100.01/Contract No. 071357, 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, 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 pursuant to the provisions of RCW 39.08.

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. 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 and/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. 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 the _____ day of _____, 20____.

IMPORTANT: Surety companies executing bonds must have an A.M. Best Rating of "A-, FSC (6)" or higher, 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

Printed Name and Title

Printed Name and Title

Power of Attorney attached.

END OF SECTION

BOND NO.: _____

PROJECT TITLE: Terminal 3 & Terminal 4 Shore Power Project

PROJECT NO.: 201100.01

CONTRACT NO.: 071357

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 five (5) percent of any increases in the Contract Price 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. 071357 with the Port for Terminal 3 & Terminal 4 Shore Power Project, Project No. 201100.01.

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

WHEREAS, the Principal has requested that the Port accept a bond in lieu of earned retained funds as allowed under RCW 60.28.

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 RCW 60.28. 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 RCW 60.28, 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 RCW 60.28 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 _____, 20____.

By: _____
Principal

Address: _____

City/ST/Zip: _____

Phone: _____

Surety Name: _____

By: _____
Attorney-In-Fact

Address: _____

City/ST/Zip: _____

Phone: _____

IMPORTANT: Surety companies executing bonds must have an A.M. Best Rating of "A-, FSC (6)" or higher, and be authorized to transact business in the State of Washington.

END OF SECTION

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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. "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.
- B. "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.
- C. "Day" means a calendar day unless otherwise specifically designated.
- D. "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.
- E. "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.
- F. "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.
- G. "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.
- H. "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.
- I. "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.
- J. "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 and information 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. Division 00 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 and all information provided with the Bid 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 Baseline Project 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 and the Northwest Seaport Alliance, including their respective Commissions, officers, managers, and employees, 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. Cyber risk indemnification. Contractor shall defend, indemnify, and hold harmless the Indemnified Parties from and against any liability, expense, fines, penalties, cost, demand, or other obligation, resulting from or out of any cyber-related risk that includes theft, loss or misuse of data, release of private information as result of a network breach, penetration, compromise, or loss of IT systems control.
- H. 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.
- I. 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 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 MWBE, VETERAN-OWNED, AND SMALL BUSINESS ENTERPRISE PARTICIPATION.

- A. In accordance with the legislative findings and policies set forth in RCW 39.19, the Port encourages participation in all of its contracts by MWBE firms certified by the Office of Minority and Women's Business Enterprises (OMWBE). Participation may be either on a direct basis in response to this invitation or as a subcontractor to a Bidder. However, unless required by federal statutes, regulations, grants, or contract terms referenced in the Contract Documents, no preference will be included in the evaluation of Bids, no minimum level of MWBE participation shall be required as a condition for receiving an award, and Bids will not be rejected or considered non-responsive on that basis. Any affirmative action requirements set forth in federal regulations or statutes included or referenced in the Contract Documents will apply.

The Port encourages participation in all of its contracts by Veteran-owned businesses (defined in RCW 43.60.010) and located at <http://www.dva.wa.gov/program/certified-veteran--and-servicemember-owned-businesses> and Small, Mini, and Micro businesses (defined in RCW 39.26.010)

- B. In accordance with EPA Grant 01J65101 and Utilization of Small, Minority and Women's Business Enterprises 40 CFR, Part 33 the Port requires the Prime Contractor to make the following Good Faith Efforts:
 1. Ensure Disadvantaged Business Enterprises (DBEs) are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities. For Indian Tribal, State and Local and Government recipients, this will include placing DBEs on solicitation lists and soliciting them whenever they are potential sources.
 2. Make information on forthcoming opportunities available to DBEs and arrange time frames for contracts and establish delivery schedules, where the requirements permit, in a way that encourages and facilitates participation by DBEs in the competitive process. This includes, whenever possible, posting solicitations for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date.
 3. Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs. For Indian Tribal, State and local Government recipients, this will include dividing total requirements when economically feasible into smaller tasks or quantities to permit maximum participation by DBEs in the competitive process.
 4. Encourage contracting with a consortium of DBEs when a contract is too large for one of these firms to handle individually.
 5. Use the services and assistance of the Small Business Administration (SBA) and the Minority Business Development Agency of the Department of Commerce.

5.03 APPRENTICESHIP PARTICIPATION

- A. In accordance with RCW 39.04.320, fifteen (15) percent Apprenticeship Participation is required for all projects estimated to cost one million (\$1,000,000) dollars or more.
- B. Apprentice participation, under this contract, may be counted towards the required percentage (%) only if the apprentices are from an apprenticeship program registered and approved by the Washington State Apprenticeship and Training Council (RCW 49.04 and WAC 296-05).

- C. Bidders may contact the Department of Labor and Industries, Specialty Compliance Services Division, Apprenticeship Section, P.O. Box 44530, Olympia, WA 98504-4530 by phone at (360) 902-5320, or e-mail at Apprentice@lni.wa.gov, to obtain information on available apprenticeship programs.
- D. For each project that has apprentice requirements, the contractor shall submit a "Statement of Apprentice and Journeyman Participation" on forms provided by the Port of Tacoma, with every request for project payment. The Contractor shall submit consolidated and cumulative data collected by the Contractor and collected from all subcontractors by the Contractor. The data to be collected and submitted includes the following:
 - 1. Contractor name and address
 - 2. Contract number
 - 3. Project name
 - 4. Contract value
 - 5. Reporting period "Beginning Date" through "End Date"
 - 6. Name and registration number of each apprentice by contractor
 - 7. Total number of apprentices and labor hours worked by them, categorized by trade or craft.
 - 8. Total number of journeymen and labor hours worked by them, categorized by trade or craft
 - 9. Cumulative combined total of apprentice and journeymen labor hours
 - 10. Total percentage of apprentice hours worked
- E. No changes to the required percentage (%) of apprentice participation shall be allowed without written approval of the Port. In any request for the change, the Contractor shall clearly demonstrate a good faith effort to comply with the requirements for apprentice participation.

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 Baseline Project 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 Baseline Project 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 or 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. 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-, 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 reasonable, actual costs of the delay for which the Port is wholly responsible. The limitation on damages set forth in this Section does not apply to any damages arising exclusively from delay to which the Contractor is entitled to recover under Section 8.03(F).
- 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).

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.
 3. 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 fifteen (15) 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-, 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. On contracts of one hundred fifty thousand dollars or less, at the option of the contractor as defined in RCW 39.10.210, the Port may, in lieu of the bond, retain ten percent of the contract amount for a period of thirty days after date of final acceptance, or until receipt of all necessary releases from the department of revenue, the Employment Security Department, and the Department of Labor and Industries and settlement of any liens filed under chapter 60.28 RCW, whichever is later. The recovery of unpaid wages and benefits must be the first priority for any actions filed against retainage held by a state agency or authorized local government.

For contracts of one hundred fifty thousand dollars or less, the Port may accept a full payment and performance bond from an individual surety or sureties.

- C. 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 Baseline Project 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 SUMMARY

- A. This Section includes requirements for the Contractor's insurance.

1.02 SUBMITTAL REQUIREMENTS

- A. Evidence of the required insurance within fifteen (15) days of the issued Notice of Award to the Contractor.
- B. Updated evidence of insurance as required until final completion.

1.03 COMMERCIAL GENERAL LIABILITY (CGL) 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 six (6)" or better.
- B. The Port of Tacoma (Port) and the Northwest Seaport Alliance (NWSA) will be included as additional insureds for both ongoing and completed operations by endorsement to the policy using ISO Form CG 20 10 11 85 or forms CG 20 10 04 13 and CG 20 37 04 13 (or equivalent coverage endorsements). The inclusion of the Port and the NWSA as additional insureds shall not create premium liability for either the Port nor the NWSA.

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; and
 - 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 Subcontractors 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 Contractor's 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 and the NWSA 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. Marine 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;
- f. Marine coverages as appropriate for the scope of work.

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. Marine Protection and Indemnity/Vessel Pollution Liability: Contractor shall obtain, at Contractor's expense and keep in effect during the term of the Contract, Marine Protection and Indemnity insurance which shall include Collision Liability and Jones Act coverages, including coverage for all masters, crew, and passengers. The limit of liability shall not be less than \$5,000,000. If Collision Liability is part of the Hull and Machinery coverage for the vessel, evidence of Hull and Machinery coverage in amounts not less than the actual cash value of the vessel shall also be provided.
 - a. Vessel Pollution Liability: Contractor shall obtain, at Contractor's expense and keep in effect during the term of the Contract, Vessel Pollution Liability on all vessels used under this Contract. Vessel Pollution Liability limits shall be the same as the Protection and Indemnity (P&I) limits called for in Section 2.
3. 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.
4. 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 or 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 and the NWSA shall be named as an additional insured(s) on the CPL policy.

5. Technology Professional Liability Errors and Omissions Insurance appropriate to the Consultant's profession and work hereunder, with limits not less than \$2,000,000 per occurrence. Coverage shall be sufficiently broad to respond to the duties and obligations as is undertaken by the Vendor in this agreement and shall include, but not be limited to, claims involving infringement of intellectual property, copyright, trademark, invasion of privacy violations, information theft, release of private information, extortion and network security. The policy shall provide coverage for breach response costs as well as regulatory fines and penalties as well as credit monitoring expenses with limits sufficient to respond to these obligations.

The policy shall include, or be endorsed to include, **property damage liability coverage** for damage to, alteration of, loss of, or destruction of electronic data and/or information "property" of the Agency in the care, custody, or control of the Vendor.

- 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. If the coverage is aggregated, the coverage shall be no less than two times the per occurrence or per claim limit. 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. Any additional insured endorsement shall NOT be limited to the amounts specified by this Contract, unless expressly waived in writing by the Port.
- 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 fifteen (15) 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 and the NWSA are named as additional insured(s).
- 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) day's-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. To the extent the Work provided under this Contract does not include the construction, rehabilitation or repair of any dam, road or bridge, and whenever the estimated cost of the Work is less than \$25,000,000, the Port and Contractor acknowledge that the Port will purchase, or has purchased, from 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. Without further endorsement, the coverage afforded by this insurance includes the interests of the Port, the Contractor, and Subcontractors of any tier on the Project. Coverage for materials intended to be installed in the facility will be covered by the Builder's Risk policy. Losses up to the deductible amount, and payment of any deductible amount, shall be the responsibility of the Contractor. All tools and equipment not intended as part of the construction or installation (including but not limited to Contractor's equipment and tools) will NOT be covered by the policy.

To the extent the Work provided under this Contract involves any dam, roadway or bridge, the value of which exceeds \$250,000, or whenever the estimated cost of the Work is equal to or greater than \$25,000,000, Contractor will purchase from a company or companies lawfully authorized and admitted to do business in Washington, property insurance written on a Builder's Risk "all-risk" (excluding 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 Builder's Risk 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. Contractor shall provide evidence satisfactory to the Port confirming the coverage afforded by this insurance shall include the interests of the Port, the Contractor, and Subcontractors of any tier on the Project. Coverage for materials intended to be installed in the facility will be covered by the Builder's Risk policy purchased by the Contractor. Losses up to the deductible amount, and payment of any deductible amount, shall be the responsibility of the Contractor.

In all instances, the Contractor shall obtain property insurance for all Contractor-owned equipment and tools and, in the event of loss, payment of any deductible amount shall be the 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 Date, the applicable effective date for prevailing wages for this Project is March 22, 2022.
- 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://lni.wa.gov/prevailing-wage-policies>
- 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 printed copy of the applicable prevailing wage rates are also available for viewing at the Port Administration Building, located at 1 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 provided schedule of prevailing wage rates and the published rates applicable under WAC 296-127-011, 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 with the Department of Labor and Industries for approval.
 - 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 Department 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: (i) a copy of the Statement of Intent to Pay Prevailing Wages approved by the Industrial Statistician of the Department of Labor and Industries and (ii) 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 Department of Labor and Industries.
- 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 RCW Title 51 ("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 its 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 (1) 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. Pacific Maritime Association card
 - 5. Labor organization identification card
- B. Identification cards shall be visible while on the Project site or easily displayed when requested.

1.02 TRANSPORTATION WORKER IDENTIFICATION CARD (TWIC) SUMMARY

- A. TWIC is required for all personnel needing unescorted access to secure and restricted areas of Port facilities subject to 33 CFR 105, including truckers, surveyors, construction personnel, and delivery personnel. Secure areas are those areas with security measures for access control in accordance with a Coast Guard approved security plan. Restricted areas are those areas within a secure area that require increased limited access and a higher degree of security protection. New terminals under construction prior to terminal operations may not be designated secure areas. Construction on existing maritime transportation facilities and punchlist or other type of work requirements on facilities that have been certified under 33 CFR will require a TWIC.
- B. Contractors should allow for application and enrollment for the security threat assessment and issuance of TWIC when submitting a bid.

1.03 ESCORTING

- A. To access restricted Port facilities, all un-credentialed individuals must be accompanied by a person who has been issued a TWIC and trained as an escort at that specific facility. Each restricted facility has their own guidelines for escorting. Having escort training at one facility does not qualify you to escort at other facilities. Prior to conducting escort services for non-TWIC personnel, the escorts are required to contact the Facility Security Officer at the gate for verification they are on the escort list and to document who is being escorted. For required documentation, upon completion of escorting, the escort is to inform the Security officer that the escort is complete. It is the Contractor's responsibility to schedule escort training with the Facility Security Officer.
- B. For more information, refer to the Port Security website at:
<http://www.portoftacoma.com/shipping/security>
- C. For Project specific information, refer to Section 01 14 00 - Work Restrictions.

1.04 ELIGIBILITY FOR TWIC

- A. Refer to the Transportation Worker Identification Credential website at: <https://www.tsa.gov/for-industry/twic> for information on eligibility and applying for TWIC.

1.05 TWIC USE AND DISPLAY

- A. Each worker granted unescorted access to secure areas of a facility or vessel must present their cards to authorized personnel, who will compare the holder to his or her photo, inspect

security features on the TWIC, and evaluate the card for signs of tampering. The Coast Guard will verify TWIC's when conducting vessel and facility inspections and during spot checks using hand-held scanners, ensuring credentials are valid.

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, commissioned, and ready for use, and as described in these documents.
 2. The Terminal 3 & Terminal 4 Shore Power Project Project consists of:
 - a. Furnishing and installation of medium voltage (13.8kV to 6.6kV) electrical shore to ship power substations and equipment such as transformers, switchgear assemblies, walk-in enclosures (including shore power switches, relays, controls, metering, status indications, and interlocks), power factor correction capacitors in enclosures, and 7.2kV shore power receptacles, with separate systems for the Terminal 3 and Terminal 4 vessel berths;
 - b. Furnishing and installation of shore power receptacles in five existing concrete wharf bullrail vaults and one new vault (for a total of three vaults per each berth), including concrete core drilling and rework of conduit entry into existing vaults, and shore power boxes;
 - c. Demolition and retrofit installation of one new concrete shore power vault at the north end of the existing Pier 3 wharf bullrail (including steel covers), as well as under wharf conduit, pull box and hangar installation;
 - d. The majority of the work includes providing and pulling of 15kV and 600V conductors through existing conduit/ductbank pathways to the five existing bullrail vaults, but some new ductbanks are required including new pathways from the existing Terminal 3 substation to the new bullrail vault and a Tacoma Power ductbank for new utility service equipment at Terminal 3;
 - e. Electrical infrastructure includes furnishing and installation of ductbanks, conduits, grounding grids, concrete service slabs for equipment, vaults, junction boxes, hand-holes, conductors and pulling of electrical conductors and fiber optic cables;
 - f. Electrical upland site work including, but not limited to, pavement sawcutting, pavement removal, demolition, vault removal and re-installation, trench excavation, earthwork, off-site hauling and disposal of excess soil, utility bedding, backfill, compaction and new asphalt pavement;
 - g. Work includes coordination for installation of 15kV power switch (Terminal 3 only) and utility revenue meters by Tacoma Power, including installation of supporting vaults and ductbank per utility standards as part of this contract;
 - h. Electrical system acceptance testing and vessel commissioning; and
 - i. All other required work including temporary erosion and sediment control (TESC), restoration of disturbed striping and pavement markings, upland protective bollards and guard rail systems for electrical equipment, and a new stormwater catch basin and piping at the existing Pier 4 substation.

1.02 LOCATION

- A. The work is located at:

1101 Port of Tacoma Road
Tacoma, WA 98421

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

- 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.
- D. The Facility will remain in operation during the entire construction period. The Contractor shall conduct their operations so as to prevent interference with normal terminal operations outside of any that have been negotiated and pre-approved by the Engineer.
- E. The Work under this Contract requires special attention to the scheduling and conduct of each task which has the potential to interrupt or hamper normal terminal operations. Select tasks are required to be scheduled around busy terminal activity periods. Identify on the construction schedule each task and work operation that may result in an impact to terminal operations.

1.02 CONTRACTOR ACCESS AND USE OF PREMISES

- A. Refer to Section 01 55 00 for site access and parking requirements.
 - B. Activity Regulations
 - 1. Ensure Contractor personnel deployed to the project become familiar with and follow all regulations or restrictions established by the Engineer.
 - C. Working Facility
 - 1. The Facility will remain in operation for the duration of construction. The Contractor shall conduct all items of the Work in such a manner as to prevent interference with the normal operations of the Facility.
 - 2. Terminal operated equipment/vehicles shall have right-of-way at all times.
 - 3. Terminals 3 & 4 are secure and restricted areas. All work performed at the terminals will require TWIC credentials, as specified in Section 00 73 63 Security Requirements.
 - 4. The designated contractor laydown area is located off-terminal, as shown on Sheet G2.1. TWIC credentials are required in this area of the Port. Contractor shall escort all non-TWIC workers to the laydown area (e.g. material and equipment deliveries).
 - 5. TWIC Escorting Requirements:
 - a. TWIC escort personnel are not permitted work assignments outside of observing non-TWIC workers.
 - b. TWIC escort personnel may observe a maximum of five non-TWIC workers.
 - c. All contractor personnel who are to receive escort training must coordinate to attend single classroom date.
 - D. 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. Restore all common areas to a clean and useable condition that permits the resumption of terminal operations after the Contractor ceases daily work.
 - b. 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.
 - c. Ensure all materials, tools and equipment will be removed from the site or secured within the designated laydown area at the end of each shift.

1.03 WORK CONSTRAINTS

- A. Work shall be coordinated with the Engineer (or Engineer's Representative) and terminal operations shall not be impacted by construction activities in any unplanned manner. Permission to interrupt Tenant activity or utility service shall be requested in writing to the Engineer a minimum of one week before the desired date of interruption.
- B. Refer to Drawing G2.2 for detailed work restrictions, phasing plan, and notification requirements. Work constraints apply to several aspects of the project scope including, but not limited to:
 1. electrical power outages
 2. access to existing upland vaults and manholes
 3. work at new and existing bullrail vaults
 4. under dock work
 5. trenching, backfill, and paving activities across drive aisles, under existing container stacking areas, and through active terminal areas
 6. soil stockpiling and equipment staging
- C. As shown on Drawing G2.2, the tenant's "Gearman Area" is located in the corner of Terminal 3 in close proximity to contractor work areas. The tenant will actively utilize this area during the entire project construction window. Contractor shall maintain an open ingress/egress path to the Gearman Area at all times.
- D. Business hours at Terminal 3 and Terminal 4 are subject to change with limited notice as dictated by vessel schedules. Tenant operations may be active around the clock (24-hours) depending on vessel needs.
 1. Each berth is typically occupied by a vessel between 2 - 4 weekdays (Monday - Friday) per week. Vessels are also frequently at berth on weekends. These examples are provided for information-only to alert the Contractor to heavy usage of the terminals surrounding the project's construction work areas. Actual vessel schedules will be highly variable and Contractor shall be flexible in planning their work schedule.
 2. The Port will provide up-to-date Terminal 3 and Terminal 4 vessel schedules on a regular basis during project construction. The NWSA website may also be referenced at any time (sort by 'Husky' terminal): <https://www.nwseaportalliance.com/cargo-operations/vessel-schedules-and-calendar>.

PART 2 - PRODUCTS

PART 3 - EXECUTION

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

- A. Procedures for preparation and submittal of applications for progress payments.

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. For each pay estimate the Contractor shall submit the following:
 - 1. Completed Contractor invoice and updated Schedule of Values tracking sheet as required by Division 01 or as established by the Engineer.
 - 2. Baseline Project Schedule and narrative updated as required by Section 01 32 16 of the Project Manual.
 - 3. Completed "Amounts Paid to Subcontracts and Suppliers" showing total contract amount, amount paid this estimate, total paid to date, and balance owing.
 - 4. Completed "Conditional Release and Waiver of Liens and Claims."
 - 5. An estimated cashflow statement projecting the Contractor's monthly billings on the project shall be submitted with each payment application.
- C. 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.
 - 4. The Contractor shall submit the updated baseline project schedule for review prior to submitting the payment application to ensure the payment processing is not held up due to necessary schedule revisions.
- D. Following the Engineers' review, the Contractor shall submit the agreed upon pay estimate electronically, with complete supporting documentation, using e-Builder®.

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 MEASUREMENT OF QUANTITIES FOR UNIT PRICES

- A. Measurement Standards:
 - 1. All Work to be paid for at a contract price per unit measurement, as indicated in the Contractor's submitted bid, will be measured by the Engineer in accordance with United States Standard Measures.
- B. Measurement by Weight:
 - 1. Reinforcing steel, steel shapes, castings, miscellaneous metal, metal fabrications, and similar items to be paid for by weight shall be measured by scale or by handbook weights for the type and quantity of material actually furnished and incorporated into the Work.
 - 2. Unless shipped by rail, material to be measured and paid for by weight shall be weighed on sealed scales regularly inspected by the Washington State Department of Agriculture's Weights and Measures Section or its designated representative. Measurement shall be furnished by and at the expense of the Contractor. All weighing, measuring, and metering devices shall be suitable for the purpose intended and shall conform to the tolerances and specifications as outlined in Washington State Department of Transportation Standard Specifications, Division 1, General Requirements, Article 1-09.2, Weighing Equipment.
 - 3. Provide or utilize platform scales of sufficient size and capacity to permit the entire vehicle or combination of vehicles to rest on the scale platform while being weighed. Combination vehicles may be weighed as separate units provided they are disconnected while being weighed. Scales shall be inspected and certified as often as the Engineer may deem necessary to ascertain accuracy. Costs incurred as a result of regulating, adjusting, testing, inspecting, and certifying scales shall be borne by the Contractor.

4. A licensed weighmaster shall weigh all Contractor-furnished materials. The Engineer may be present to witness the weighing and to check and compile the daily record of such scale weights. However, in any case, the Engineer will require that the Contractor furnish weight slips and daily summary weigh sheets. In such cases, furnish a duplicate weight slip or a load slip for each vehicle weighed, and deliver the slip to the Engineer at the point of delivery of the material.
5. If the material is shipped by rail, the certified car weights will be accepted, provided only actual weight of material will be paid for and not minimum car weights used for assessing freight tariff. Car weights will not be acceptable for material to be passed through mixing plants. Material to be measured by weight shall be weighed separately for each bid item under which it is to be paid.
6. Trucks used to haul material being paid for by weight shall be weighed empty daily and at such additional times as the Engineer may require. Each truck shall bear a plainly legible identification mark. The Engineer may require the weight of the material be verified by weighing empty and loaded trucks on such other scales as the Engineer may designate.

C. Measurement by Volume:

1. Measurement by volume will be by the cubic dimension indicated in the Contractor's submitted bid. Method of volume measurement will be by the unit volume in place or removed as shown on the Contract Drawings or as specified.
2. When material is to be measured and paid for on a volume basis and it is impractical to determine the volume by the specified method of measurement, or when requested by the Contractor in writing and accepted by the Engineer in writing, the material may be weighed in accordance with the requirements specified for weight measurement. Such weights will be converted to volume measurement for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by the Resident Engineer and shall be agreed to by the Contractor before such method of measurement of pay quantities will be accepted.

D. Measurement by Area: Measurement by area will be by the square dimension shown on the Contract Drawings or as specified. Method of square measurement will be as specified.

E. Linear Measurement: Linear measurement will be by the linear dimension listed or indicated in the Contractor's submitted bid. Unless otherwise indicated, items, components, or Work to be measured on a linear basis will be measured at the centerline of the item in place.

F. Field Measurement for Payment:

1. The Contractor shall take all measurements by providing equipment, workers, and survey crews as required to measure quantities in accordance with the provisions for measurement specified herein. No allowance will be made for specified tolerances.
2. The Engineer will verify all quantities of Work performed by the Contractor on a unit-price basis, for progress payment purposes.

1.06 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.

1.07 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, those necessary for the movement of its personnel, equipment, supplies and incidentals to and from the project site; temporary facilities and controls; for the establishment and removal of its offices, buildings and other facilities necessary for work on the project; for other work and operations which it must perform or costs it must incur before beginning production work on the various items on the project site, and for removal of personnel, equipment, supplies, offices, building facilities, sheds, fencing, and other incidentals from the site.
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: Project Administration

1. Item Description: The Work of this item includes all administrative costs associated with administering and supervising the project including, but not limited to supervision of personnel, coordination of all work activities, coordination of subcontractors and/or suppliers, preparation and transmittal of submittals, permit acquisitions, for premiums on bonds and insurance for the project, and project overhead.
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: Soil Handling, Stockpiling and Disposal

1. Item Description: The Work of this item includes all materials, tools, equipment, labor, and incidentals required to stockpile, load, transport and dispose of excess or geotechnically unsuitable soils from on-site stockpiles as described in these Specifications and directed by the Engineer. This item includes disposal tipping fees. All soils that leave the site need to be tested prior to disposal. The Port will test, profile, and characterize the stockpiled soils designated for off-site disposal. Soil testing is not included and will be paid directly by the Port.
2. Measurement: This item will be measured per ton for soil disposed of as determined on the basis of legible copies of certified weight receipts or other documentation of weight from the disposal site as approved by the Engineer.
3. Payment: This item will be paid for at the unit price indicated on the bid form and on actual quantities for the period being billed.

D. Item #4: Pier 3 Bullrail Vault SSB0 Construction & Under Wharf Conduit Installation

1. Item Description: The Work of this item includes furnishing and installation of the new SSB0 bullrail vault structure, as well as under wharf pull box, expansion/deflection fittings, conduit and support installation required to create new infrastructure to allow for cable pulling and receptacle installation as shown in the drawings and as described in these specifications. This work includes items to provide a conduit pathway and vault similar to the other existing bullrail vaults.

This work includes installation of conduits thru the existing sleeves at the bulkhead and continuation of the conduit pathway under the wharf from the waterside of the bulkhead, but does not include any infrastructure upland of the existing bulkhead.

Providing of shore power receptacles, cables, and cable pulling are not included in this item and will be paid under Item #5: Terminal 3 Shore Power System.

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: Terminal 3 Shore Power System

1. Item Description: The Work of this item includes furnishing and installing complete electrical and communication systems required for a complete functional shore power system at Terminal 3 as shown in the drawings and as described in these specifications. Work includes the following:
 - a. Medium Voltage Power Substation and Equipment including, but not limited to, demolition, shore power substation/switchgear assembly, medium voltage power walk-in enclosure, power factor correction capacitors, shore power receptacles, ductbanks, conduits, cables, cable pulling, grounding grid, concrete slabs, equipment, acceptance testing (including load banks), and other appurtenances, required to furnish a complete shore power system.
 - b. Electrical upland site work including, but not limited to, sawcutting, pavement removal, demolition, vault removal, trench excavation including safety provisions, earthwork, bedding, backfill, compaction and base course import/placement; as well as furnishing and installation of conduits, ductbanks, vaults, junction boxes, hand-holes, conductors, and pulling of electrical conductors (15kV and 600V) and fiber optic cables.

Work also includes coordination with Tacoma Public Utilities (TPU), including installation of vaults/ductbanks per utility standards for their equipment and coordination to schedule the work to be performed by TPU.
 - c. Work within and adjacent to existing bullrail vaults including, but not limited to, demolition, pavement removal, wharf ballast removal/stockpiling/reuse, core drilling, rework of conduit entry into existing bullrail vaults, existing Pier 3 bullrail vault lid modifications, limit switches, and shore power receptacle installation.
 - d. All acceptance testing and other required testing (with the exception of commissioning with a vessel) for the Terminal 3 shore-to-ship power systems and equipment, as described in Section 26 01 26 of the specifications.
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: Terminal 4 Shore Power System

1. Item Description: The Work of this item includes furnishing and installing complete electrical and communication systems required for a complete functional shore power system at Terminal 4 as shown in the drawings and as described in these specifications. Work includes the following:
 - a. Medium Voltage Power Substation and Equipment including, but not limited to, demolition, shore power substation/switchgear assembly, medium voltage power walk-in enclosure, power factor correction capacitors, shore power receptacles, ductbanks, conduits, cables, cable pulling, grounding grid, concrete slabs, equipment, acceptance testing (including load banks), and other appurtenances, required to furnish a complete shore power system.
 - b. Electrical upland site work including, but not limited to, sawcutting, pavement removal, demolition, vault removal, trench excavation including safety provisions, earthwork, bedding, backfill, compaction and base course import/placement; as well as furnishing and installation of conduits, ductbanks, vaults, junction boxes, hand-holes, conductors, and pulling of electrical conductors (15kV and 600V) and fiber optic cables.

Work also includes coordination with Tacoma Public Utilities (TPU), including installation of vaults/ductbanks per utility standards for their equipment and coordination to schedule the work to be performed by TPU.
 - c. Work within and adjacent to existing bullrail vaults including, but not limited to, demolition, pavement removal, wharf ballast removal/stockpiling/reuse, core drilling, rework of conduit entry into existing bullrail vaults, existing Pier 4 bullrail vault lid modifications, limit switches, and shore power receptacle installation.
 - d. All acceptance testing and other required testing (with the exception of commissioning with a vessel) for the Terminal 4 shore-to-ship power systems and equipment, as described in Section 26 01 26 of the specifications.
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: Asphalt Paving

1. Item Description: The Work of this item includes hauling and placement of asphalt pavement surfacing on the wharf and in the terminal uplands including compaction, joint sealants and tack coats as shown on the drawings and as defined in the specifications.
2. Measurement: This item will be measured per ton of furnished and accepted material calculated from certified weight tickets and delivery slips collected on-site by the Engineer.
3. Payment: This item will be paid for at the unit price indicated on the bid form and on actual quantities for the period being billed.

H. Item #8: Commissioning with Vessel

1. Item Description: The Work of this item includes commissioning activities, as described in Section 26 09 99 of the specifications, necessary to demonstrate the Terminal 3 and Terminal 4 shore-to-ship power delivery systems will supply a designated ship with shore

power so that ship power generators can be shut down.

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: All Other Work

1. Item Description: The Work of this item includes completion of all work, as shown on the drawings and as defined in the specifications, that is not specifically identified or included in other bid items described in this section. This includes, but is not limited to, health and safety requirements, temporary erosion and sediment control (TESC), construction stormwater pollution control requirements, field engineering requirements, striping and pavement markings, upland bollards and guard rail systems, new stormwater infrastructure (catch basin, cleanouts and piping), and earthwork not specifically identified under other items of work.
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: Unforeseen Conditions Allowance

1. Item Description: This allowance will be for UNFORESEEN CONDITIONS for work unidentified at the time of bid and will be paid preferably as negotiated unit price(s) or lump sum(s). If unit prices or lump sums cannot be established, work will be paid on a time and material basis per Section 00 72 00 General Conditions Article 8.0. Work under this bid item shall be accomplished upon written direction of the Engineer as a Minor Change in Work. This entire bid item may or may not be used.
2. Measurement: This item will be measured based upon the method agreed upon for each Minor Change issued.
3. Payment: This item will be paid at the price agreed upon for each Change in Work issued by the Engineer in accordance with procedures noted in Section 01 26 00 – Change Management Procedures. For longer duration changes incremental payment for completed work shall be a percentage, determined by the Engineer, payable in monthly progress payments, proportional to the work completed.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

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

1.02 SUBMITTALS

- A. The Contractor shall submit for approval the following documentation to the Port for force account change orders:
 - 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.

1.03 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.

1.04 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.

1.05 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 8.02.B 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 1.05.A.
 4. Comply with requirements in Section 00 26 00 Substitution Procedures 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.

1.06 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.

1.07 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.

- a. The Contractor shall sign and return the Change Order to the Engineer within **four (4) days** following receipt of the Change Order from the Engineer. If the Contractor fails to return the signed Change Order within the allotted time, the Engineer may issue a Unilateral Change Directive.

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 Items. 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. The Schedule of Values is based on unit priced bid items and a breakdown of each lump-sum bid item. The total dollars for the Schedule of Values shall total the bid amount.
- 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, and
 - 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 10 days of contract execution.
 - 1. 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.
 - 3. The Pre-Construction Meeting will be held at the Port of Tacoma Administration Building located at One Sitcum Plaza, if possible. However, based on assessment of current COVID-19 conditions, the Pre-Construction meeting may instead be completed via conference or web-based call.
- 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

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

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

1.02 USER ACCESS LIMITATIONS

- A. Contractor's access to e-Builder® is granted and controlled by the Engineer.
 - 1. The users assigned by the Contractor to use e-Builder® 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 e-Builder® 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 e-Builder® as described above.
 - 2. Information, basic user guides and requirements on methods for using e-Builder®.
 - 3. Instruction for the Contractor's staff utilizing e-Builder®.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 UTILIZATION OF E-BUILDER®

- 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 e-Builder®.
- C. The Port will not be liable for any delays associated from the usage of e-Builder® 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 e-Builder® software be grounds for a time extension or cost adjustment to the contract.

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

- A. This section includes the requirements to provide a preliminary schedule and construction progress schedule, bar chart type.

1.02 SUBMITTALS

- A. Within 10 days following execution of the contract, submit a baseline project schedule defining planned operations.
- B. If the baseline project schedule requires revision after review, submit revised baseline project schedule within 10 days.
- C. Within 20 days after review of baseline project schedule, submit draft of proposed complete baseline project schedule for review.
- D. Submit updated progress schedule monthly to the Engineer with each pay application as required in Section 01 20 00 Price and Payment Procedures.

1.03 QUALITY ASSURANCE

- A. Scheduler: Contractor's personnel or Consultant specializing in Critical Path Method (CPM) scheduling with one year's minimum experience in scheduling construction work of a complexity comparable to this Project, and having use of computer facilities capable of delivering a detailed graphic printout within 48 hours of request.

1.04 SCHEDULE FORMAT

- A. The baseline project schedule shall be produced using the CPM format.
- B. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.
- C. Sheet Size: Multiples of 11 x 17 (280 x 432 mm).

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 BASELINE SCHEDULE

- A. Prepare baseline project schedule in the form of a horizontal bar chart.
- B. The baseline project schedule shall include all the activities listed in the Schedule of Values and be directly related to items listed in the Bid Form. The Contractor is encouraged to add sufficient activities to facilitate a clear understanding of the means and methods planned for the various work items.
- C. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction and critical path. At a minimum it shall include and show the following:
 - 1. A time scale showing the elementary work items needed to complete the work;
 - 2. Estimated time durations for each activity, defined as any single identifiable work step within the project;
 - 3. A graphical network diagram showing the logical sequence of activities, their precedence relationships, and estimated float or leeway available for each;

4. The different categories of work as distinguished by crew requirements, equipment requirements, and construction materials; and
 5. The different areas of responsibility, such as distinctly separate or subcontracted work, and identifiable subdivisions of work.
- D. It shall be maintained and updated as necessary to accurately reflect past progress and the most probable future progress.
 - E. Activities shown shall include submittals, milestones, and sufficient task breakdown for major components of work.
 - F. Identify work of separate stages and other logically grouped activities.
 - G. Provide sub-schedules to define critical portions of the entire schedule.
 - H. Provide separate schedule of submittal dates for shop drawings, product data, samples, owner-furnished products, products identified, and dates reviewed submittals will be required from the Engineer. Indicate decision dates for selection of finishes.

3.02 PROGRESS SCHEDULE

- A. From the regularly-maintained baseline project schedule, progress schedules showing a three-week look-ahead, one-week look-back, shall be submitted and distributed at the weekly progress meetings. The progress schedule shall represent a practical plan to complete the work shown within the contract work window presented. At a minimum, the presentation, typically a Gantt-style chart, shall convey the task durations, a logical work sequence, task interdependencies, and identify important or critical constraints.
- B. Submittal and distribution of progress schedules will be understood to be the Contractor's representation that the scheduled work meets the requirements of the contract documents and that the work will be executed in the manner and sequence presented, and over the durations indicated.
- C. The scheduling, coordination, and execution of construction in accordance with the contract documents are the responsibility of the Contractor. The Contractor shall involve, coordinate, and resolve scheduling with all subcontractors, material suppliers, or others affected in development of the progress schedules.
- D. The progress schedule shall be used for coordination purposes for inspection and testing purposes as well as validation of work progress against the baseline schedule.

3.03 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. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
- D. Indicate changes required to maintain Date of Substantial Completion.
- E. Submit reports required to support recommended changes.
- F. Contractor shall submit an updated progress schedule with each pay application and include a written narrative describing the overall progress of the work. The narrative shall include the following key aspects:
 1. Progress in the last period.

2. Critical Path progress and schedule concerns.
3. Changes to schedule logic or sequencing of the work.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

- A. This section includes the requirements to provide a submittal log and project submittals.

1.02 SUBMITTAL LOG

- A. Contractor shall, within 14 days of contract execution 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. Item Description
 - 2. Category
 - 3. Specification Section information of the applicable section
 - 4. After the submittal log is reviewed and approved by the Engineer, it shall become the basis for the submittal of all items by Contractor.

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.
 6. Rejected - Means, submitted material does not conform to the Contract Documents in a major respect (e.g., wrong material, size, capacity, model, etc.).
- B. Submittals marked "No Exceptions Taken," "Make Corrections Noted," or "Reviewed as Noted" authorizes Contractor to proceed with construction covered by those data sheets or shop drawings with corrections, if any, incorporated.
- 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 submit all shop drawings, catalog cuts, brochures and physical samples using e-Builder® (a web based construction management software). All post-document-generated notations such as notes, arrows, stamps, clouding, or other items, are required to be shown directly on the submittal document. **Each submittal shall be accompanied by a transmittal developed within the e-Builder® software.**
- B. A separate submittal shall be prepared for each product or procedure and shall be further identified by referencing the Specification Section and paragraph number and each submittal shall be numbered consecutively.

- C. Product submittals that cannot be accomplished electronically shall be submitted electronically without attachments, marked as being hand delivered, and accompanied by a printed version of a transmittal.
- D. Shop and detail drawings shall be submitted in related packages. All equipment or material details which are interdependent, or are related in any way, must be submitted 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 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. Components or materials which require shop drawings and which arrive at the job site prior to approval of shop drawings shall be considered as not being made for this project and 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 e-Builder® 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 will not be considered grounds for a contract time extension.

3.02 PRE-WORK SUBMITTALS

- A. Prior to issuance of Notice to Proceed, the following submittals must be submitted and returned to the Contractor as No Exceptions Taken, Make Corrections Noted, Reviewed, or Reviewed as Noted.
 - 1. Baseline Project Schedule per Section 01 32 16 - Construction Progress Schedule
 - 2. List of Contractor and Subcontractor Personnel per Section 00 73 63 – Security Requirements including emergency contacts for each Company on-site
 - 3. Submittal Log per Section 01 33 00 - Submittal Procedures
 - 4. Health and Safety Plan (HASP) and Spill Prevention, Control, and Countermeasures (SPCC) Plan per Section 01 35 29 - Health Safety and Emergency Response
 - 5. List of equipment and written certification per Section 01 35 47 - Air and Noise Control

3.03 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. Provide an updated copy of the submittal log to the Engineer during each weekly progress meeting, unless otherwise approved by the Engineer.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

- 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. Information regarding the known nature and extent of contaminated soil in the project area is included in Section 00 31 26 Existing Hazardous Material Information.
 - 1. Refer to Section 01 74 16 - Soil Characteristics and Waste Management and Section 31 00 00 - Earthwork for characterization, handling, and disposal requirements.
 - 2. Due to the relatively shallow depth of typical trenching activities, and the design depth of the primary containment cap according to the reference drawings, exposure of the capped contaminated materials is not expected for those and similar-depth activities.
 - 3. Contractor may encounter contaminated materials when excavating for vault installation within the footprint of the Slip 1 NCD facility at varying depths below the primary containment cap.
- 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.

1.02 SUBMITTALS

- A. Prior to Notice to Proceed, 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. Suspicious materials and/or unidentified materials,
 - g. Confined-space entry (could include dewatering storage tanks, manholes, or other items),
 - h. Confined-space rescue, and
 - i. Odorous conditions;
9. Exposure monitoring to be used to evaluate actual hazards compared with anticipated conditions;
 10. Site housekeeping procedures and personal hygiene practices;
 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),
 - b. Respirator fit testing, and
 15. Name and qualification of person preparing the HASP and person designated to implement and enforce the HASP;
 16. Excavation, stockpiling, and truck loading procedures;
 17. Lighting and sanitation; and
 18. 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.
- D. The Contractor shall include in the HASP recent requirements associated with the State's COVID-19 Job Site Requirements as noted at in Appendix G or online at <https://www.governor.wa.gov/sites/default/files/Phase%201%20Construction%20COVID-19%20Safety%20Requirements%20%28final%29.pdf>.

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. Potential Exposures Routes

1. Inhalation: Airborne dusts, fibers, particulates, or vapors may be released during site activities.
2. Skin and Eye Contact: Dusts generated during site work activities may settle on the skin or clothing of site workers. Also, workers may contact sediments or water containing hazardous materials in the normal course of their work. Precautions to prevent skin or eye contact with hazardous materials will be included in the HASP.
3. Ingestion: Inadvertent transfer of site contaminants from hands or other objects to the mouth could occur if site workers eat, drink, smoke, chew tobacco, or engage in similar activities in work areas. This could result in ingestion of site contaminants. Precautions to prevent accidental or inadvertent ingestion of hazardous materials will be included in the HASP.

C. 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 and vessels, 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. 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; and
 3. 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; and
 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 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. First aid equipment;
 - 15. Spill response and spill prevention equipment; and
 - 16. 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.
- C. The Contractor's HASP shall be amended as needed by the CIH or CSP to include special work practices warranted by jobsite conditions actually encountered. Special practices could include provisions for decontamination of personnel and equipment, and the use of special equipment

not covered in the initial plan.

- 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; and
 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 SUMMARY

- 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 a list of equipment to be used on the project and written certification 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); or
 - 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.
- B. All internal combustion engines used on the job shall be equipped with a muffler of a type recommended by the manufacturer.

END OF SECTION

PART 1 – GENERAL

1.01 SUMMARY

- 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.
- C. The Port will provide archaeological monitoring by or under the guidance of a professional archaeologist (archaeologist), as needed.

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 "Archaeological Monitoring and Inadvertent Discovery Plan" (Appendix F)

1.03 AUTHORITY OF ARCHAEOLOGIST

- A. When archaeological monitoring is needed (as determined by the Port), the authority of the archaeologist is as follows:
 - 1. At any time, when the archaeologist determines that possible cultural resources or skeletal remains might be present, they have the authority to stop work, secure the area of the find and determine a work stoppage zone. This area shall remain protected until further decisions can be made regarding the work site.
 - 2. The archaeologist will stand in close proximity of the construction equipment to view subsurface deposits as they are exposed and will be in close communication with the equipment operators to ensure adequate opportunity for observation and documentation. The monitor will coordinate the depths of the lifts with the Port and the Contractor.
 - 3. The archaeologist will be provided the opportunity to screen excavated sediments and matrix samples when this is judged to be useful.
 - 4. Archaeological monitoring will proceed until it can be determined by the archaeologists that skeletal remains or other cultural resources are not likely to be impacted by construction activities.

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:
 - 1. Site Development Permit (SDEV21-0278), Appendix B
 - 2. Tacoma Power Electrical Plan Review (2021-066), Appendix C
 - 3. Shoreline Substantial Development Permit Exemption (LU20-0052), Appendix D
 - 4. State Environmental Policy Act (SEPA) Exemption, Appendix E
- B. Conform with the requirements of listed permits and additional or other applicable permits, codes, and regulations as may govern the Work.
- C. 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 1.01.A above and Special Inspections called for by the International Building Code).
- D. 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.
- E. 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 to 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.

PART 2 - PRODUCTS - NOT USED

PART 3 – EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

- A. This section includes 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. The Contractor shall perform such detailed examination, inspection, 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 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 from performing work to contract requirements.
- D. Re-testing required because of non-conformance to specified requirements will be charged to the Contractor by deducting testing charges from the Contract Sum via Change Order.
- 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.

1.05 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 SUMMARY

- A. This section includes requirements relating to the following:
 - 1. Temporary utilities,
 - 2. Temporary telecommunications services,
 - 3. Temporary sanitary facilities,
 - 4. Temporary Controls: Barriers and fencing, and
 - 5. 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. Contractor is responsible for getting required permits and revenue meters from the City of Tacoma. Coordinate with Tacoma Power to obtain and pay for temporary electrical service at contractor laydown/staging area and both construction sites of Pier 3 and Pier 4.
- B. Existing facilities shall not be used.
- C. 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. It is the Contractor's responsibility to be able to receive phone calls and emails at the job site.

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. Construction: Contractor's option.
- B. Provide 6 ft. (1.8 m) high fence around construction site; equip with vehicular gates with locks.

1.07 FIELD OFFICES (CONTRACTOR'S OPTION)

- A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack and drawing display table.
- B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.

1.08 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to final inspection.
- B. Clean and repair damage caused by installation or use of temporary work.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

- A. This section includes requirements relating to the following:
 - 1. Access roads
 - 2. Parking
 - 3. Construction parking controls
 - 4. Haul routes
 - 5. Maintenance
 - 6. Removal, repair
 - 7. 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. Terminals 3 & 4 are secure and restricted areas. All work performed at the terminals will require TWIC credentials, as specified in Section 00 73 63 Security Requirements. Refer to Section 01 14 00 Work Restrictions for TWIC escorting requirements.
- B. The designated contractor laydown area is located off-terminal, as shown on Sheet G2.1. TWIC credentials are required in this area of the Port. Contractor shall escort all non-TWIC workers to the laydown area (e.g. material and equipment deliveries).
- C. Access to the contractor laydown area and Terminal 3 construction site will be through the Port's Main Gate at the intersection of Port of Tacoma Road and E. 11th Street. Access to the Terminal 4 construction site will be via entrance road off of Port of Tacoma Road. Refer to Drawing G2.1 for the delineated access routes. There is frequently congestion near these access points. Terminal traffic will back up along E. 11th Street in the mornings, over lunch and when trains are switching into the North Intermodal (NIM) Yard. The Contractor should approach from Port of Tacoma Road to avoid the queuing delays along E. 11th Street.
- D. The Contractor may be required to relocate and adjust its traffic control, entry points, gates, or related work areas as required by Port or Tenant (Husky) operations. The Contractor shall conduct all business through the gate, or gates, assigned for access by the Engineer.
- E. Provide unimpeded access for emergency vehicles. Maintain 20 foot (6 m) width driveways with turning space between and around combustible materials.
- F. Provide and maintain access to fire hydrants free of obstructions.

3.03 PARKING

- A. All Contractor's employee cars and other private vehicles shall be parked in the contractor laydown area, as shown on Drawing G2.1, or within the designated project work area limits as shown on Drawings G3.1, G3.2, and G3.3.

3.04 CONSTRUCTION PARKING CONTROL

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

3.05 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.
- C. Designated haul routes are subject to crossing by heavy machinery and terminal operations vehicles.

3.06 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.

3.07 REMOVAL, REPAIR

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

3.08 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.

END OF SECTION

PART 1 – GENERAL

1.01 SUMMARY

- 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; and
 - 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) Phase I Municipal Stormwater Permit (MS4) for projects less than one acre.

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," current version.
 - 2. Washington Department of Ecology Phase I Municipal Stormwater Permit (MS4), current version.
 - 3. Washington State Department of Transportation, current version, Standard Specification M41-10, Division 8-01 Erosion Control and Water Pollution Control.
 - 4. Pierce County Stormwater and Site Development Manual, current version (if applicable).

1.03 SUBMITTALS

- A. Prior to the start of any construction activities, a Construction Stormwater Pollution Prevention Plan (SWPPP), as required by the MS4.
 - 1. The Port has prepared a project SWPPP template that complies with the MS4 requirements. This template is included in Appendix A.
 - 2. Contractor shall comply with a Contractor provided project SWPPP.
 - 3. Contractor shall be responsible for updating the project SWPPP during construction to reflect the required changes to BMPs and personnel, as needed, to comply with the MS4 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 at a time interval (e.g., weekly, monthly) specified by the Engineer.
- 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 is subject to a Phase I Municipal Stormwater Permit (MS4). The Contractor shall be responsible for compliance with the Department of Ecology Western Washington Stormwater Management Manual, Volume II, Construction Stormwater Pollution Prevention 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 NPDES permit associated with the Project.
- D. Contractor shall be solely responsible for all BMP modifications and upgrades to comply with the MS4 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. Contractor shall prepare and submit a site-specific SWPPP prior to initiating ground disturbing activities.
 - 1. The SWPPP describes construction activities and sequencing, and the proposed Temporary and Permanent Erosion and Sediment Control measures. If there are any changes to BMPs or personnel on the site, Contractor must update the SWPPP and be prepared to submit the SWPPP to the Port and Ecology upon request.
 - 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 (current version) 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. A SWPPP template is available to the Contractor for this purpose. The template was prepared by the Port to meet part of the National Pollution Discharge Elimination System (NPDES) stormwater permit requirements for the project. Contractor may use the applicable Port template to prepare the project SWPPP or prepare their own SWPPP. If the Contractor elects to prepare their own SWPPP, it must meet or exceed the control measures required by Ecology (reference Ecology's Stormwater Management Manual for Western Washington, current version).
 4. 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 (current version) 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.
- C. Contractor shall inspect the existing system and report to the Engineer the levels of existing material prior to installation of TESC BMPs.

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. Contractor shall clean all stormwater components affected by construction debris prior to Work completion, per TESC BMPs for catch basin maintenance. 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.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

- A. This section includes the requirements to provide product data under the applicable specification section.

1.02 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 SUMMARY

- A. This section includes requirements relating to the following:
 - 1. Examination, preparation, and general installation procedures
 - 2. Cutting and patching

1.02 SUBMITTALS

- A. 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; and
 - 5. Work of the Port or separate Contractor.
- B. 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; and
 - 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 SUMMARY

- A. This section includes information for progress and final cleaning and restoration of damaged work prior to final inspection.

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. Comply with waste disposal requirements in Section 01 74 16.
- 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 until 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 exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances.
 - f. Remove debris and surface dust from limited access spaces, including roofs, attics, and similar spaces.
 - g. Sweep concrete floors broom clean in unoccupied spaces.
 - h. Remove labels that are not permanent.
 - i. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
 - j. 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 surfaces. 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 soils management and construction waste management requirements.
- B. The work includes demolition and removal within the project areas as shown on the drawings. The work also includes waste generated by construction activities, materials, packaging, scraps, and garbage.
- C. Soils that cannot be reused onsite and are anticipated to be exported to an off-site facility must have a completed soil profile prior to export. The Port will conduct testing of material as defined further in this specification. The Contractor is responsible for any additional testing necessary to satisfy requirements of the Contractor's receiving facility.
 - 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.
- D. Anticipate the presence of potentially contaminated material within the footprint of the Slip 1 Nearshore Confined Disposal (NCD) facility at varying depths below the primary containment cap.
 - 1. Information regarding the known nature and extent of contaminated soil in the project area is included in Section 00 31 26 Existing Hazardous Material Information.
 - 2. Due to the relatively shallow depth of typical trenching activities, and the design depth of the primary containment cap according to the reference drawings, exposure of the capped contaminated materials is not expected for those and similar-depth activities.
 - 3. Contractor may encounter contaminated materials when excavating for vault installation within the footprint of the Slip 1 NCD facility at varying depths below the primary containment cap.

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.
- 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.
- N. Olfactory Indications (methods): Of or relating to the sense of smell. Soils contaminated with petroleum and other volatile constituents typically exhibit characteristic odors that can be detected (and sometimes identified) by smell.
- O. PID: Photo Ionization Detector. A field instrument that is used to detect the presence of and give a relative indication of the concentration of vapors emitted from volatile constituents (contamination) in environmental media (soil and water).
- P. Soil (waste) Profile: A characterization of the chemical and physical properties of a waste material including the types of contaminants and their concentrations as measured by approved laboratory analytical methods. A profile is required by the receiving permitted disposal or recycling facility.
- Q. Special Handling: Refers to hauling and disposal of soils that, because they are contaminated, cannot be reused in place as backfill or as general fill at another location. Such soils must be hauled to and managed at a permitted disposal or recycling facility.
- R. Type A Contaminated Soil: Soil that must be removed from the Project site and has been determined by the Engineer to contain petroleum hydrocarbons in concentrations exceeding state or federal cleanup standards or special Port determined criteria. Type A soil requires disposal at an approved facility.
- S. Type B Contaminated Soil: Soil that must be removed from the Project site and has been determined by the Engineer to contain petroleum hydrocarbons or other contaminants in concentrations that will require disposal or recycling at one of the approved facility.
- T. Type C Contaminated Soil: Soil determined by Engineer to contain unknown constituent(s) and requires further testing and classification. Type C soil requires disposal at one of the approved facility.
- U. Type D Material: Material including soil, determined by the Engineer not to require special handling with regard to this Contract. Classification of material as Type D material 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.

- V. Unanticipated Contamination: Contamination 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 contamination.
- W. Visual Indications (methods): A preliminary evaluation of the potential presence of contamination based on visual observation. For example, fuel contaminated soils are frequently discolored or stained relative to non-petroleum impacted native soils or clean fill.

1.03 SUBMITTALS

- A. Waste Management Plan
- B. Waste Management Final Report
- C. Soils Management Plan
- D. Soils Hauling Receipts

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 WASTE MANAGEMENT PLAN

- A. Submit a Waste Management Plan within 10 days after the notice to proceed and not less than 5 days before any demolition activities in accordance with these specifications. Provide a Waste Management Plan in a format as approved by the Engineer.
- B. The Waste Management Plan shall include the following:
 - 1. Name of designated Waste Management Coordinator.
 - 2. A list of waste materials, including estimated types and quantities, of the waste that will be generated. Indicate salvaged for resale, salvaged for reuse, recycled, or disposed for each item.

3. Identify waste handling methods to be used, including one or more of the following:
 - a. Method 1 - Contractor or subcontractor(s) hauls recyclable materials to an approved recycling facility.
 - b. Method 2 - Contracting with diversion/recycling hauler to haul recyclable material to an approved recycling or material recovery facility.
 - c. Method 3 - Recyclable material reuse on-site.
 - d. Method 4 - Recyclable material salvage for resale.
 - e. Method 5 - Contractor or subcontractor hauls waste to an approved disposal facility.
 4. Identification of each recycling, disposal, or material recovery facility to be utilized, including name, address and types of materials being recycled at each facility.
 5. Description of the method to be employed in collecting, and handling, waste materials.
 6. Description of methods to communicate Waste Management Plan to personnel and subcontractors.
 7. Actions that will be taken to reduce solid waste generation.
- C. Revise and resubmit Waste Management plan as required by the Engineer. Approval of the Contractor's Plan does not relieve the Contractor of responsibility for compliance with all applicable laws and regulations. Distribute copies of the Waste Management Plan to each subcontractor.

1.06 WASTE MANAGEMENT FINAL REPORT

- A. Provide a Waste Management Final Report, in a format approved by the Engineer. The Waste Management Final Report shall list the following for the project:
 1. A record of each waste material type and quantity recycled, reused, salvaged, or disposed from the Project. Include total quantity of waste material removed from the site and hauled to a landfill.
 2. Percentage of total waste material generated that was recycled, reused, or salvaged.
- B. Quantities shall be reported by weight (tons) unless otherwise approved by the Engineer.
- C. Submit copies of manifests, weight tickets, recycling/disposal receipts or invoices, which validate the calculations or a signed certification of completeness and accuracy of the final quantities reported.

1.07 SOILS MANAGEMENT PLAN

- A. A minimum of 10 days prior to excavation of any subsurface materials, submit a Soils Management Plan to the Engineer. The Soils Management Plan must be approved by the Engineer prior to any excavation of subsurface materials. Include the following in the Soils Management Plan:
 1. Identification of all soil disposal/recycling facilities to be used on the project for Type A and B Contaminated Soil.
 2. Identification of all fill sites, disposal facilities and/or end uses of material determined to be Type D Material.
 3. Contingency for delivery and placement of Type C Contaminated Soil at an onsite Soil Stockpile area.

4. Contingency for managing debris encountered during excavation that may disqualify soil for disposal or recycle at the approved facilities.
 5. General description of how equipment operators, safety personnel and other applicable Contractor shall coordinate with the Engineer to facilitate handling of contaminated soil in accordance with this specification.
 6. Description of all haul routes to be used on the project.
- B. Include in the Two Week Look Ahead Schedule specific time frames for excavation. Each excavation activity shall be given an individual line item description, time frame and duration.
- C. No soil shall be removed from the site without a completed soil profile and 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).

1.08 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.

1.09 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 Procedures.

These provisions include any special monitoring, personal protective equipment, or work plans to accommodate contaminated soil or material handling. Use of environmental characterization data may not be appropriate for health and safety purposes.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 WASTE DISPOSAL

- A. Source-Separated CDL Recycling: Provide individual containers for separate types of CDL waste to be recycled, clearly labeled with a list of acceptable and unacceptable materials.
- B. Co-Mingled CDL Recycling: Provide containers for co-mingled CDL waste to be recycled, clearly labeled with a list of acceptable and unacceptable materials.
- C. Landfill: Provide containers for CDL waste that is to be disposed of in a landfill clearly labeled as such.
- D. Removal of CDL Waste from Project Site: Transport CDL waste off Port's property and provide legal disposal.

3.02 SOIL DISPOSAL

A. Excavation/Testing

1. The field-testing for soil to be exported offsite will be performed by the Port and will result in the following classification of material as defined in paragraph DEFINITIONS of this section:
 - a. Type A Contaminated Soil.
 - b. Type B Contaminated Soil.
 - c. Type C Contaminated Soil.
 - d. Type D Material.
2. Contractor shall give Port no less than one week notice for sampling export soil prior to disposal offsite. Contractor shall anticipate at least two weeks for lab results.
3. 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.

B. Transportation and Off-site Disposal of Soils

1. 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 onsite.
2. 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.
3. Contractor shall ensure that any vehicle transporting materials offsite are properly labeled and placarded in accordance with federal and state DOT requirements.

C. Disposition of Material

1. Type A and B Contaminated Soil: Material determined to be Type A or B Contaminated Soil shall be hauled by the Contractor to an approved facility for disposal.
2. Type C Material: Material determined to be Type C is of unknown origin or special circumstances. Material determined to be Type C contaminated soils shall be hauled to an onsite Soil Stockpile Site area. The Contractor shall protect the material once stockpiled. The Port will direct the Contractor on the disposition of the material following the analysis of the suspect material.
3. Type D Material: Material determined not to require special handling (Type D) shall be hauled by the Contractor to a site determined by the Contractor. If testing or certification of this material is required by the receiving site, the Contractor shall complete these requirements. The Port will not certify or declare the material suitable for unrestricted use.

D. Other Requirements

1. Cover all soil stockpiles and maintain stockpile areas in accordance with Section 01 57 13 - Temporary Erosion and Sediment Control and Construction Stormwater Pollution Prevention.

2. Material determined to be Type A, Type B or Type C contaminated material may be, upon approval of the Engineer, temporarily stockpiled within the construction area. Provide an impervious liner beneath this soil and securely cover with a waterproof covering. Remove the material prior to completion of work in the work area.
3. Submit all hauling receipts (or copies of receipts) from the receiving facility for all Type A, Type B or Type C Contaminated soil at least weekly.
4. The Engineer may require shut down of excavation should unforeseen condition warrant.

END OF SECTION

PART 1 - GENERAL

1.01 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

1.02 ACTION SUBMITTALS

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

1.03 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.

1.04 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected.
- 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, operation and maintenance manuals, 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 10 days prior to the date the work will be completed and ready for final 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. Reinspection: Request reinspection 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.

1.05 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.

1.06 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, 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 7 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. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
- C. Execution of all Change Orders.

1.07 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. Contractor's signed waiver and release of claims on the Engineer provided form;
3. Contractor's submittal of list of all suppliers and subcontractors and the total amounts paid to each on the Engineer provided form; and
4. 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 SUMMARY

- 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 final inspection. This copy will be reviewed and returned after final inspection, with Engineer comments. Revise content of all document sets as required prior to final submission.
 - 3. Submit 3 sets of revised final documents in final form by Final Completion.

PART 2 - PRODUCTS

2.01 OPERATION AND MAINTENANCE MANUALS

- A. For shore power substations, power walk-in enclosures, power factor correction capacitor enclosures, and shore power receptacles, 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) 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 Port 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 Port.
 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 Port.
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 RELATED WORK SPECIFIED ELSEWHERE

- A. The provisions and intent of the Contract, including the General Conditions and General Requirements, apply to this work as if specified in this section. Work related to this section is described in:
 - 1. Section 02 90 00 – Fugitive and Silica Dust Control Procedures

1.02 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 pavement, bollards, electrical vaults, 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. Backfilling and compaction of holes, voids, trenches or pits that result from such removal.
 - 4. Core-drilling through existing concrete
- 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.

1.03 DEFINITIONS

- A. Demolition:
 - 1. Complete removal and disposal of all items within the areas depicted on the Drawings, unless noted otherwise, by means such that surrounding structures are not damaged.
- B. Select Demolition:
 - 1. Removal and disposal of items within the areas depicted on the Drawings utilizing means and methods such that embedded items to remain are protected for reuse on the structure and in such a way as to leave a clean and plane surface suitable for reattachment or re-incorporation into the new structure.

1.04 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 waste and documentation. The procedures shall provide for safe conduct of the work, careful removal and disposal 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. The DMP shall include the means and methods for removing specified portions of existing structures as shown on the Drawings. This shall include descriptions of selective demolition at interface areas where existing structure will remain. The DMP shall include means and methods to prevent demolition materials, debris, water from construction activities, etc. from falling into or entering the Blair Waterway.

2. Submittal requirements in Section 01 35 43.13 - Hazardous Materials Handling Procedure and 01 74 16 - Soil Characteristics and Waste Management may be included as part of DMP plan or submitted separately.
- B. Ground-Penetrating Radar (GPR) Personnel Certification
1. Contractor shall submit certification that the GPR locating personnel have experience-based training that meets or exceeds the guidelines detailed in American Society of Nondestructive Testing (ASNT) document 'Recommended Practice SNT-TC-1A, Personnel Qualification and Certification in Nondestructive Testing Level 1'.

1.05 SITE CONDITIONS:

- A. Husky Terminal (Terminals 3 and 4) are operating facilities. The work shall be completed in accordance with phasing and access shown on the drawings. Access to the site is restricted by ongoing terminal operations. Contractor operations shall be restricted to the designated areas.
- B. Coordinate and schedule, with the Engineer, access to the site in advance, and acknowledge that terminal operations take precedence over construction activities.
- C. For access to the site see Section 01 55 00 – Vehicular Access and Parking.
- D. All demolition items not identified for salvage or recycle shall become the property of the Contractor. Disposal of all demolition items shall be in accordance with the specifications, local, state and federal requirements.

PART 2 – PRODUCTS

- 2.01 All products that are required to repair, accomplish, or be incorporated into the work shall be selected by the Contractor, subject to the approval of the Engineer.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Utility locates shall be performed prior to the 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 feasible, prior to the start of work. Notify the Engineer immediately, if observed conditions differ from anticipated conditions.

- C. Contractor shall protect-in-place existing utilities, storm drain pipes, catch basins, manholes, sanitary sewer pipe, sanitary sewer manholes, water lines, water valves, cleanouts, and pedestals for light poles and fire hydrants within the project limits.
- D. Contractor shall saw cut and remove the existing asphalt concrete pavement as shown on the Drawings.

3.02 DEMOLITION OF STRUCTURES

- A. Completely remove and dispose of all designated items. Infrastructure or materials designated to remain that are damaged by Contractor activities shall be replaced or repaired at the Contractor's expense.
- B. Do not damage existing pavement which is to remain in place. Pavement demolition shall be accomplished by making neat vertical saw cuts at the boundaries of areas to be removed.
- C. Unless otherwise shown, $\frac{3}{4}$ - inch deep saw cuts shall be used at the interface of demolished concrete areas and areas to remain. Full-depth saw cuts shall be used where full-depth demolition is shown in the Drawings, except at areas where existing reinforcing to remain crosses the plane of demolition where selective demolition is required. Concrete edges to remain shall be cut back and squared off to eliminate feather edges in abutting concrete.
- D. Some areas of selective demolition will be required at the interface between existing portions of structures to be demolished and existing portions of structures to remain. For areas of selective demolition, techniques and tools shall be employed that do not damage the existing concrete and reinforcing steel for areas to remain. Use small tools appropriate for the task at hand and additional care for areas of select demolition and where existing reinforcing steel is to remain as part of the completed structure. All exposed existing reinforcing steel to remain shall be protected and cleaned by sandblasting or other approved methods to remove old concrete, surface rust, and other contaminants.
- E. At no time shall any debris be allowed to enter the water. The Contractor shall make provisions using floats, falsework, scaffolding, and other means as necessary to prevent debris from falling into the water. All debris that falls into the water, whether it sinks or floats, shall be removed immediately. Removal and disposal of all debris shall occur at no additional cost to the Port.
- F. The Contractor shall field verify existing reinforcing bar and high-strength all-thread rod locations utilizing Ground-Penetrating Radar (GPR) methods prior to core-drilling through existing concrete. Core-drill locations shall be chosen such that existing reinforcing bars and high-strength all-thread rods are not cut. High-strength all-thread rods are critical items and if damaged during core-drilling shall be repaired by the Contractor at no additional cost to the Port.

3.03 DISPOSAL OF MATERIALS

- A. Disposal of Materials
 - 1. All materials and equipment removed, and not used for 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 excavated soil to be disposed of off-site in accordance with Section 01 35 43.13 - Hazardous Materials Handling Procedure.
- B. Cleanup
1. Haul route and paved site areas will be swept by the Contractor 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 upon completion of the project.

END OF SECTION

PART 1 – GENERAL

1.01 RELATED WORK DESCRIBED ELSEWHERE

The provisions and intent of the Contract, including 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:

- A. Section 01 42 19 – Reference standards
- B. Section 01 50 00 – Temporary Facilities and Controls
- C. Section 01 74 16 – Soil Characteristics and Waste Management
- D. Section 02 41 00 – Demolition

1.02 DESCRIPTION

- A. The Contractor shall supply all labor, materials, facilities, equipment, services, employee training and testing, handling, transport, disposal, and agreements necessary to perform the work required for fugitive dust control activities and potential silica-containing dust control activities in accordance with these specifications and applicable regulations from the State of Washington Department of Labor and Industries (WISHA), Puget Sound Clean Air Agency (PSCAA), and any other applicable federal, state, and local government regulations. Whenever there is a conflict or overlap of the above references, the most stringent provisions are applicable.
- B. In all cases where potential silica dust exposures may occur, the Contractor shall use any and all feasible engineering and work practice controls to reduce and maintain employee exposure levels at or below the Washington State Permissible Exposure Limits (PELs) for silica compounds, as specified in WAC 296-62-07515. It shall be assumed that the workers generating the silica dust are exposed above the Permissible Exposure Limit (PEL) until the Contractor air monitoring demonstrates levels below the PEL.
- C. The work specified herein shall be performed by competent persons. Competent persons are those who are trained, knowledgeable, and qualified in both fugitive and silica dust evaluation and control methods.
- D. If fugitive dust emissions are visible beyond the perimeter of the work area, or if respirable crystalline silica dust concentrations exceed 0.05 mg/m³ beyond the perimeter of the work area, the Engineer is authorized to stop work. The Contractor shall perform all necessary corrective actions to eliminate visible dust and reduce respirable crystalline silica concentrations to less than 0.05 mg/m³ before resuming work. The Port may visually monitor for fugitive dust and collect air samples for silica at any time.

1.03 SCOPE OF WORK

- A. Construction work will potentially generate fugitive dust. It is the responsibility of the Contractor to control fugitive dust generation and emissions.
- B. Construction site work that requires control of silica-containing dust includes chipping, sanding, sawing, jack-hammering, drilling, and other aggressive methods on concrete building materials associated with this project.

C. Work activities shall include the following, as applicable:

1. Provide site security to assure that no member of the public is able to gain access to the construction work area at any time. The Contractor shall maintain access and egress routes at all times.
2. Provide worker training, respiratory protection, and medical examinations, as necessary, to meet applicable silica regulations and regulatory guidance regarding silica exposures where work involves the generation of concrete or demolition-related dust.
3. Adopt work practices that prevent the release of fugitive and silica dust outside of the work area, as described in Part 3 of this section.
4. Use wet methods and High-Efficiency Particulate Absorption (HEPA) vacuuming equipment within the work area to clean the work area and control fugitive dust during demolition and construction activities, and at the completion of demolition and construction activities.
5. Use barriers to prevent the release of dust from the work area to other areas of the project.
6. Provide for worker and equipment decontamination. Worker decontamination and equipment areas shall be cleaned daily or more frequently, as required, to prevent dust emissions.
7. Protect personal security, life safety, and energy management systems, including associated wiring, which shall remain operational throughout the work activities.

1.04 PERSONAL PROTECTION

A. Respiratory Protection

1. Where exposures to respirable crystalline silica may exceed the PEL of 0.05 mg/m³ based on an 8-hour time-weighted average (8-hr TWA) per WAC 296-62-07515, workers shall be provided, as a minimum, with personally issued and marked respirators equipped with high efficiency particulate air (HEPA) filters approved by the National Institute for Occupational Safety and Health (NIOSH), 99.97% efficient, that shall be worn in the designated work area. Sufficient filters shall be provided for replacement as required by the workers or applicable regulations. Disposable respirators shall not be used. Respirators and respirator supplies shall be provided to the workers at the expense of the Contractor.
2. The Contractor shall comply with OSHA 29 CFR Part 1926.134, WAC 296-62-071 (Respiratory Protection), and ANSI Standard Z88.2-1990 "Practices for Respiratory Protection."
3. No worker shall be exposed to levels greater than 0.05 mg/m³ respirable crystalline silica as determined by the protection factor of the respirator worn and the work airborne area respirable crystalline silica levels.
4. A sufficient supply of replacement parts and HEPA filter cartridges shall be provided to the workers.
5. The Contractor shall maintain daily inspection(s) of all respirators to verify cleanliness and to replace damaged, worn or missing parts.

B. Protective Clothing

1. Workers shall be provided with sufficient sets of protective full-body clothing to be worn in the designated work area whenever a potential exposure to respirable crystalline silica concentrations exists above the PEL. Such clothing shall include, but not be limited to, coveralls and eye protection.
2. Protective clothing shall not be worn outside the work area. Non-disposable-type protective clothing and footwear shall be left in the work area.
3. Eye protection shall be provided and worn as required by applicable safety regulations. Equipment shall conform to ANSI Z87.1-1989.
4. Head Protection: Hard hats or other head protection shall be provided as required by applicable safety regulations. Hard hats shall conform to ANSI Z89.1-1991, Class A or B.
5. Foot Protection: Nonskid footwear shall be provided to all workers. Footwear shall conform to ANSI Z41.1-1993, Class 75.
6. Workers shall not eat, drink, smoke, or chew gum or tobacco in or near the work areas.

1.05 SUBMITTALS

- A. Contractors shall provide complete submittals as per Section 01 33 00 – Submittal Procedures for review by the Engineer. Following receipt of review comments from the Engineer, submit additional complete sets of revised submittals. No hazardous material abatement work or demolition work will be permitted prior to submittals being approved by the Engineer. Allow fifteen (15) calendar days for submittal review.
- B. Pre-Work Submittals: The Contractor shall submit to the Engineer for review and acceptance the Contractor's Work Plan as a prerequisite to demolition activities. The work plan must be reviewed and signed by a Certified Industrial Hygienist chosen by the Contractor. The plan must be suitably titled and indexed, providing detailed information concerning the following items as a minimum in the order listed below:
 1. Safety and health hazards;
 2. Personal protective measures and decontamination system requirements;
 3. Respiratory protection program, fit testing and training records for all employees potentially exposed above the PEL;
 4. Specific work practices and procedures;
 5. Description of engineering controls designed to keep fugitive dust and silica exposures below the levels specified herein, for outside and inside each work area;
 6. Silica Air Monitoring Plan;
 7. Dust disposal plan;
 8. Emergency procedures; and
 9. Internal administrative and inspection procedures.

1.06 SILICA AIR SAMPLING EVALUATION BY CONTRACTOR

- A. The Contractor shall conduct air sampling of workers and subcontractors for respirable crystalline silica in accordance with NIOSH Method 7500, and according to the Contractor's Work Plan. This sampling is performed to evaluate workers' exposure levels.
- B. The Contractor shall conduct perimeter area air sampling in areas of the marine building and gearman area near Pier 3 substation occupied by Terminal Employees and Port Employees for respirable crystalline silica in accordance with the NIOSH Method 7500, and according to the Contractor's Work Plan. This sampling is performed to evaluate potential exposures to building occupants.
- C. The Contractor shall conduct air sampling in accordance with the NIOSH Method to collect a sufficient volume of air to determine if the airborne silica dust levels are below the PELs. If the sampling detection levels are above the PELs, the Contractor is required to re-sample at no expense to the Port of Tacoma.
- D. Results of area air samples collected by the Contractor shall be submitted to the Port Engineer within 48 hours after sample collection.

PART 2 - PRODUCTS

2.01 TOOLS AND EQUIPMENT

- A. Equipment and supplies may include but are not limited to:
 - 1. Chemicals to be used on site including solvents, dust suppressants, wetting agents, cleaning products, degreasing agents, welding/cutting supplies, and encapsulants;
 - 2. Enclosure equipment (for dust control);
 - 3. Material storage containers and supplies;
 - 4. Suitable tools for dust collection and water-jet dust suppression systems;
 - 5. Sufficient number of HEPA-filtered vacuum cleaners to cleanup visible duct residues.

PART 3 - EXECUTION

3.01 WET METHODS

- A. Use "wet" systems that eliminate or reduce dust generated by demolition activities including cutting concrete. Cleanup sludge and /or waste immediately following its generation.

3.02 ENCLOSURE METHOD

- A. Use enclosures in conjunction with air filtration devices. Air shall be moved through the filtration unit with a minimum of 1500 CFM. Provide HEPA filter-based shop vacuum units to control dust generated at the work face and use tools that include dust control features where possible.

3.03 OVERSIGHT

- A. The Engineer will stop work if, in the course of performing their monitoring duties, they observe an instance of substantial non-conformance with the contract documents

and/or a situation presenting a health hazard to workers, terminal workers/personnel, Port employees, or the public. Work shall not resume until corrective measures have been enforced. Instances of substantial non-conformance shall include, but not be limited to, the following:

1. Visible dust emissions outside of the work area barriers;
 2. Loss of negative pressurization (if required);
 3. Activities or misconduct affecting worker's or building occupant's safety; and
 4. Breaches of containment that could substantially damage building life safety systems.
- B. If poor work practices are observed, the Engineer shall direct the Contractor to make the necessary corrections. If appropriate corrections are not made, or if there is an immediate threat exists that silica dust could be released outside the work area, work shall be stopped. The decision to stop work shall be made by Engineer. The decision to stop work can also be made by the Contractor as part of the Contractor's management and control of the site and site activities.
- C. The Engineer may perform air sampling inside and outside the work area during the project. The Contractor shall cooperate fully with the Engineer and ensure the cooperation of his workers during collection of air samples and work area inspections.
- D. The Engineer's oversight role does not relieve the Contractor's obligation to comply with all applicable health and safety regulations promulgated by the federal, state, or local governments. Air monitoring results generated by the Port shall not be used by the Contractor to represent compliance with regulatory agency requirements for monitoring of workers exposure to airborne silica, nor shall any other activity on the part of the Port represent the Contractor's compliance with applicable health and safety regulations.

3.04 RECORDKEEPING

- A. The Contractor shall maintain for at least thirty (30) years, employee health and safety records for the project, as specified in WAC 296-802. Furnish one copy to the Engineer. The record shall include the following information:
1. The starting and completion dates of the project;
 2. A copy of all analytical results;
 3. Copies of negative pressure documentation records (as required);
 4. The name and address of the analytical laboratory used for silica analyses; and
 5. The name and address of all persons who were engaged in the concrete demolition activities.

END OF SECTION

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Concrete Formwork
- B. Concrete Reinforcement
- C. Cast-in-Place Concrete elements

1.02 REFERENCES

- A. General: Publications listed below form a part of this Specification to the extent indicated by references thereto.
- B. American Society for Testing and Materials (ASTM)
 - 1. ASTM A82 – Specification for Steel Wire, Plain, for Concrete Reinforcement
 - 2. ASTM A615 - Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
 - 3. ASTM C33 - Specification for Concrete Aggregate
 - 4. ASTM C94 - Specification for Ready-Mixed Concrete
 - 5. ASTM C150 - Specification for Portland Cement
 - 6. ASTM C156 - Test Method for Water Retention by Concrete Curing Materials
 - 7. ASTM C171 - Specification for Sheet Material for Curing Concrete
 - 8. ASTM C260 – Specification for Air Entraining Admixtures for Concrete
 - 9. ASTM C309 - Specification for Liquid Membrane-Forming Compounds for Curing Concrete
 - 10. ASTM C494 - Specification for Chemical Admixtures for Concrete
 - 11. ASTM C1107 – Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
 - 12. ASTM D4832 - Standard Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders
 - 13. ASTM E96 - Test Methods for Water Vapor Transmission of Materials
- C. American Concrete Institute (ACI)
 - 1. ACI 301 – Specifications for Structural Concrete
 - 2. ACI 305 – Hot Weather Concreting
 - 3. ACI 306 – Cold Weather Concreting

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4. ACI 308 - Standard Practice for Curing Concrete
 5. ACI 315 - Details and Detailing of Concrete Reinforcement
 6. ACI 318 - Building Code Requirements for Reinforced Concrete
 7. ACI 347 – Guide to Formwork for Concrete
- D. Concrete Reinforcing Steel Institute (CRSI)
1. Manual of Standard Practice (MSP), 2009, 28th Edition.
- E. Washington State Department of Transportation (WSDOT)
1. Standard Specifications for Road, Bridge, and Municipal Construction

1.03 SUBMITTALS

- A. Submit the following documents to, and obtain written approval from, the Port before placing any concrete on the job:
1. Certificates of Specification compliance for materials to be used.
 2. Proposed concrete mix design indicating constituent material contents per cubic yard of concrete.
 3. Mix design test certificates for compressive strength, yield, air content, and slump of the proposed concrete mix. As a minimum, compressive strength test results at 3, 7, 14, and 28-days shall be provided in accordance with ACI 301 4.2.3 unless otherwise specified.
 4. Manufacturer's name 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.
- B. Detailed shop drawings that are coordinated and checked for all concrete reinforcement prior to casting concrete.
1. Do not deliver concrete reinforcement to the site prior to acceptance of the shop drawings.
 2. The shop drawings shall include, but not be limited to, material specifications, bar lengths, bar bending schedules, order lists, splice lengths, and proposed splice locations.
- C. Mill certificates for each heat of reinforcing steel and threaded bars to be furnished, indicating specification compliance, yield strength, ultimate strength, and chemistry.
- D. Product Data: Submit data on the following products
1. Concrete admixtures
 2. Curing compounds
 3. Steel reinforcement materials
 4. Accessories

1.04 VERIFICATION OF ELEVATIONS AND DIMENSIONS

- A. Field verify existing surface elevations.

1.05 QUALITY ASSURANCE

- A. Inspection and Testing as follows:

1. Port will provide necessary inspection and testing as required.
2. Provide all necessary assistance and access 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 as follows:

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

PART 2 – PRODUCTS

2.01 GENERAL

- A. All concrete shall be normal weight concrete and ready-mix. Batching, mixing, transportation, and delivery of ready-mix concrete shall conform to ASTM C94.
- B. All cast-in-place concrete shall be proportioned on the basis of field experience or laboratory trial mixtures according to ACI 318, Section 5.3.

2.02 MATERIALS

- A. Cementitious Materials

1. All cement shall be Portland cement conforming to ASTM C 150.
2. Portland cement for use in mixes without fly ash shall be Type I-II or Type II conforming to ASTM C 150 except that the cement shall not contain more than 0.75 percent alkalis by weight calculated as Na₂O plus 0.658 K₂O and the content of Tricalcium aluminate (C₃A) shall not exceed 8 percent by weight.
3. Portland cement for use in mixes with fly ash shall be Type I or Type I-II conforming to ASTM C 150.
4. Fly ash, if used, shall meet the requirements of ASTM C 618, Type F, with the added provision that the loss on ignition shall not exceed 1 percent, and that the fly ash is stored in a separate silo from the cement. Split bins are not acceptable.
5. Obtain cementitious materials from same source throughout.

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- B. Aggregate
1. Aggregates shall conform to ASTM C 33. All coarse and fine aggregate shall consist of hard, tough, durable particles free from foreign and deleterious materials, and shall be stored in such a manner as to prevent segregation, excessive breakage, and the introduction of foreign material.
 2. Evaluate and test fine and coarse aggregates to be used in all concrete for alkali-aggregate reactivity in accordance with ASTM C 1260 or ASTM C 1293. Test both coarse aggregate size groups if from different sources. Test results of the combination shall have a measured expansion equal to or less than 0.10 percent at 16 days after casting when aggregates are tested in accordance with ASTM C 1260 or 0.04 percent for aggregates tested in accordance with ASTM C 1293.
 3. Grading shall conform to WSDOT Standard Specifications paragraph 9-03.1(5) Combined Aggregate Gradation for Portland Cement Concrete. Maximum nominal aggregate size shall be inch, unless approved by the Engineer.
 4. The maximum size of coarse aggregate shall not be larger than three fourths of the minimum clear spacing between reinforcing bars, between reinforcing bars and side forms, and between reinforcing bars and top or bottom surface of the concrete.
- C. Water used for mixing concrete shall conform to the quality requirements of paragraph 9-25.1 of the WSDOT Standard Specifications.
- D. Admixtures: All admixtures shall be supplied by one manufacturer approved by the Engineer.
1. 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.
 2. Water-reducing admixtures shall conform to the requirements of ASTM C 494. Dosage rates shall be in accordance with the manufacturer's recommendations.
 3. Water reducing admixture shall be Type A, D, F, or G. The amount shall control the desired workability and water/cement ratio of the mix and shall be within the manufacturer's recommended range.
- E. Epoxy Bonding Agent:
1. Two component epoxy suitable for bonding new concrete to existing in an exterior application.
 2. Meets ASTM C 881, Type V, Grade 2, Temperature Class A, B, or C, and match the surface temperatures to which the bonding agent is applied, as endorsed by the manufacturer.
 3. MasterEmaco ADH 326 manufactured by Master Builders, or Sikadur 32 HI-MOD LPL, manufactured by Sika Corporation, or equal, as approved by the Engineer before the start of the work where it will be used.
- F. Forms

1. Forms shall be wood or metal. Metal forms shall have all bolt and rivet heads countersunk so that a plane, smooth surface of the desired contour is obtained.
 2. Wood forms shall be sheathed or lined with plywood or tempered masonite so as to form even and uniform surfaces. Plywood forms shall not be used with the second ply exposed. Plywood panels shall be as large as possible.
 3. Forms shall be lined, coated, or treated with a suitable release agent or bond-breaker to ensure their timely removal with no damage to the concrete.
 - a. Release agents or bond-breaker shall be non-coloring and shall not leave a film on the concrete surface that may inhibit subsequent finishing activities required to attain the prescribed finish.
- G. Reinforcing
1. Bars shall be of the sizes and shapes shown and shall conform to ASTM A615, Grade 60. Bars shall be free of mill, scale, rust, or other coatings.
 2. Tie Wire: ASTM A82 No. 16-gage minimum double annealed black wire
- H. Mechanical couplers, where approved, shall be as follows:
1. Couplers shall develop a minimum of 125% of the minimum specified yield strength of the reinforcing bar.
 2. Lenton Lock B-Series or Quick Wedge mechanical couplers by Erico Inc, or approved equal.
 3. D-250 Bar-Lock S/CA-Series couplers by Dayton Superior, or approved equal.
 4. Zap ScrewLok SL, Zap ScrewLok Type 2, or Double Barrel Zap by BarSplice, or approved equal.

2.03 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 301.
1. Test data representing thirty recent consecutive tests for each design shall be submitted to establish the standard deviation used in Section 4.2.3.
 2. The criteria for acceptance of submitted tests shall be accordance with Section 4.2.3.1. Section 4.2.3.1 shall be amended to read, "... 500 psi of $f'c$ ", instead of 1000 psi.
 3. Where 30 recent consecutive tests are not available, the standard deviation may be determined by records based on no less than 15 tests as described in Section 4.2.3.2.

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4. Where no previous data are available, the mix or mixes shall be oversized in accordance with Section 4.2.3.1.
 5. When consecutive test data have been established during the project the oversized criteria may be relaxed in accordance with Section 4.2.3.6.
 6. Deviation from any reviewed design mix without approval of the Engineer will not be permitted.
- C. Unless otherwise indicated, concrete minimum 28-day compressive strengths are shown on the drawings.
- D. Concrete shall be ready mixed concrete conforming to ASTM C94 and the following:
1. Concrete mixtures shall conform to the most restrictive requirements of ACI 318-14 for exposure classes F2, S1, W1, and C2.
 2. Minimum Cementitious Material
 - a. Cement without fly ash: 6.5 sacks/cy (611 lbs/cy)
 - b. Cement with fly ash: 6 sacks/cy (564 lbs/cy) and 100 lbs fly ash/cy
 3. Maximum Water/Cement Ratio: 0.40, computed by weight, including free moisture on aggregate. If fly ash is used, the water/cement ratio shall be calculated as the weight of water divided by the combined weight of cement and fly ash.
 4. Air Content: 3.5 percent to 6.5 percent
 5. Slump: Maximum 8 inches and chosen to enhance workability without violating the maximum water/cement ratio requirement.
- 2.04 CURING MATERIALS
- A. Curing materials and methods shall conform to ACI 308.
- B. Curing and Sealing Compound shall conform to ASTM C309. Compound must be compatible with all applied finishes designated for use. Materials shall provide water retention not exceeding loss of .055 kg per square meter of surface in 72 hours when used at a coverage of 200 square feet per gallon and tested in accordance with ASTM C156.
- C. Non-staining Waterproof Paper Covering: ASTM C171.
- D. Polyethylene Film: Permeance not to exceed 0.20 perms when tested according to ASTM E96, Procedure B.
- 2.05 MORTAR
- A. Mortar for annular spaces at pipes entering catch basins shall comply with WSDOT Standard Specifications 9-04.3 Joint Mortar.
- 2.06 ACCESSORY MATERIALS
- A. Non-shrink Grout: ASTM C 1107/1107M; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.

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1. Minimum Compressive Strength at 48 hrs: 2,400 psi.
 2. Minimum Compressive Strength at 28 days: 7,000 psi.
- B. Epoxy adhesive for anchoring bolts and reinforcing steel into existing concrete, shall be one of the following:
1. Hilti HIT – RE 500 V3
 2. Simpson SET – XP
 3. Approved Equal
- C. Mechanical Concrete Anchors where specified shall be Hilti HDA-PR mechanical undercut for overhead applications or Hilti KB-TZ2 316 stainless steel anchors as indicated or approved equal.
1. ICC Reports shall be submitted for all mechanical anchor products.
 2. Mechanical anchors for overhead installations submitted for review as an equal product to the Hilti HDA-PR anchors shall be undercut that allow visual confirmation of full set. Other types of mechanical anchors, such as wedge anchors, will not be considered an equal.
 3. Mechanical shall be installed per the manufacturer's recommendations. Special Inspection is required for all mechanical anchors per IBC Chapter 17. Refer to the Contract Drawings for additional inspection requirements.

PART 3 – EXECUTION

3.01 FORMWORK

- A. Forms shall be used to confine the concrete to the shape, line, and dimensions of the members, and shall be substantial and sufficiently tight to prevent leakage of mortar. Forms shall be adequate in strength, securely anchored and properly braced and/or tied together to maintain position, shape, and alignment within the specified tolerances during all concrete placement and consolidation of operations.
- B. The inside of forms shall be clean, free of encrusted grout and coated with a form release compound appropriate for the form surface and concrete finish required. Forms shall be thoroughly wetted before placing concrete. Under no circumstances shall form release compound be allowed to contact reinforcing steel or construction joint surfaces.
- C. Openings, embedded objects, and reinforcement shall be placed at the locations shown on the drawings. They shall be formed and fastened securely in position to maintain minimum cover for all reinforcement, and to leave smooth surfaces, true openings, accurate geometry, etc., after the forms are removed.
- D. Forms may be set with a slight bevel or draft for easy removal, where approved by the Engineer. Use -inch chamfer strips on all exposed inside and outside corners
- E. Prior to installation of form work, forms for exposed concrete shall be treated with a release agent, bond-breaker, or parting compound. Apply the compound at a

rate recommended by the manufacturer, to provide a smooth surface free of dusting action caused by the chemical reaction of the compound.

F. Form Removal

1. Forms shall remain in place for the minimum length of time indicated below, provided the ambient temperature is 40 degrees Fahrenheit or higher during that time period.
 - a. Side forms or wall faces: 7 days
2. When temperatures lower than 40 degrees prevail, forms shall remain in place longer and at the Engineer's direction.
 - a. All periods where the ambient temperature is below 40 degrees Fahrenheit shall be disregarded in determining the length of time forms are to remain in place.
 - b. The Contractor may submit for prior approval a cold-weather concreting plan in accordance with ACI 306R.
 - c. Development and incorporation of an approved cold-weather concreting plan shall be at the Contractor's expense.
3. For elements described on the Civil Drawings (C-series) or the Electrical Drawings (E-series) the minimum time that forms shall remain in place may be reduced under the following conditions.
 - a. When concrete cylinder tests, according to ACI 318, indicate that a compressive strength greater than or equal to 80 percent of the specified 28-day strength has been reached.
 - b. Additional concrete cylinder testing for the purpose of establishing the 80 percent threshold level shall be at the Contractor's expense.
4. The removal of forms as stipulated herein shall in no case relieve the Contractor of responsibility for the performance, acceptability, or finish of the work.
5. All form and falsework removal shall be accomplished in a manner that prevents damage to the concrete, concrete finishes, and adjacent work elements.

3.02 REINFORCING

- 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 reinforcement installation may commence.
- B. Details of bending, placing, and splicing of all reinforcing steel shall conform to ACI 318 and ACI SP-66, except as modified herein.
- C. 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 the CRSI MSP. 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.

- D. General Fabrication Requirements for Reinforcing Bars: 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 CRSI MSP.
- E. Placing and Fastening:
1. Place all steel reinforcement accurately and hold firmly in the position indicated on the drawing during the placing and setting of concrete. Tie bars at all intersections.
 2. Minimum concrete cover to reinforcement shall be as indicated on the drawings:
 3. Maintain the minimum distance from the forms by means of stays, blocks, ties, hangers, or other approved supports.
 - a. Holding reinforcement from contact with the forms shall be by approved metal or plastic chairs. Metal chairs which are in contact with the exterior surface of the concrete shall be plastic-coated for the full depth of the indicated concrete cover.
 - b. Separate layers of bars by plastic chairs, by precast mortar blocks of compressive strength not less than 3750 pounds per square inch, spacing bars, or by other devices approved equal.
 - c. The minimum spacing between bars, except at lap splices, shall not be less than one bar diameter or one inch minimum, but not less than 1-1/3 times the maximum size of the coarse aggregate.
 4. In the event that conduits, anchor bolts, piping, inserts, sleeves, embedded objects, headed studs, or other items interfere with placing reinforcement as indicated on the drawings, or as otherwise required, immediately contact the Engineer and obtain approval of a new procedure before placing concrete.
 5. Splicing: Furnish reinforcement in the full lengths indicated on the Drawings. When approved, stagger splices as far as possible. Minimum length of lap splice shall be per the schedule of minimum lap splice lengths in the drawings unless noted otherwise on the drawings.
- F. 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 the bond between steel and concrete.

3.03 CONCRETE

A Placement

1. Concrete shall not be placed without adequate cover during expected rainy periods. Cover materials shall be at the job site, ready for installation before concreting is started and shall remain in place until the concrete has set sufficiently to resist any damage to the finish from rainfall.

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2. Water shall be removed from within forms and excavation before and during placement of concrete.
 3. Concrete shall be deposited in all cases as near as practicable directly in its final position and shall not be caused to flow in the mass in a manner to permit or cause segregation. Dropping concrete a distance of more than 5 feet vertically without proper confinement or depositing a large quantity at any point and running or working it along the forms will not be permitted.
 4. Concrete shall be consolidated with the aid of mechanical vibrating equipment supplemented by hand spading and tamping. Vibrating equipment shall be of the internal type and shall at all times be adequate to properly consolidate all concrete.
- B. Cold and Hot Weather Concreting
1. Do not place concrete when the atmospheric temperature drops below 40 F or rises above 90 F unless special procedures are followed. The temperature of the concrete at time of placement shall not be over 80 degrees Fahrenheit.
 2. Production, delivery, placing, curing, inspection and testing of concrete under hot or cold weather conditions shall comply with ACI 305, "Hot Weather Concreting" or ACI 306, "Cold Weather Concreting".
- C. Construction Joints
1. Joints and stoppages, except as specifically shown on the drawings, shall conform to ACI 318, Chapter 6. Wire mesh or similar materials shall not be used.
 2. Submit for the Engineer's approval all requests for additional, deleted, or relocated construction joints. Changes as a result of such requests shall be at the Contractor's expense.
 3. Thoroughly clean and roughen all joint surfaces and remove loose concrete, gravel, sediment, laitance, and all other deleterious substances.
 4. Apply epoxy bonding agent to existing concrete surfaces prior to placing fresh concrete. Application shall be accordance with manufacturer's recommendations.
- D. Finishing
1. Spreading dry cement for finishing is not permitted.
 2. Finishing operations of all formed surfaces shall begin immediately upon removal of the forms and shall be completed within 8 hours following form removal. Immediately after form removal, all fins, unsightly ridges and projections, and exposed lips and edges shall be removed with a sharp tool or stone to make smooth and flush with adjoining surfaces. All tie rod holes shall be mortar packed. Honeycomb areas shall be patched or cut-out and replaced as directed by the Engineer.
 3. Float Finish: All concrete slabs shall be float finished and sloped to indicated grades. Floating may be performed by use of hand or power-

driven equipment. Floating shall be started as soon as the screeded surface has stiffened sufficiently to produce a uniform surface free from screed marks.

E. Curing

1. Protect concrete from premature drying. Provide temporary housing, covering, heating, cooling, or other protection as needed. Follow finishing operations with curing measures within 2 hours.
2. Keep concrete continuously moist for 7 days. Prevent rapid drying at the end of the curing period. Accomplish cure by one of the following methods:
 - a. Absorbent mats or fabrics kept continuously wet.
 - b. Use curing compounds as specified. Remove compound film from all exposed surfaces at the end of curing period. Obtain Engineer's approval for all curing compounds used on vertical surfaces.
 - c. Non-staining waterproof paper as specified. Keep all joints airtight and weighted in place.
 - d. Non-staining polyethylene film as specified. Keep all joints weighted to prevent wind penetration.

F. Tolerances

1. Maximum Variation of Surface Flatness: 1/4 inch in 10 ft.
2. Maximum Variation from True Position: 1/4 inch.

G. Protection

1. Immediately after placement, protect concrete from premature drying, excessive hot or cold temperatures, and mechanical injury.
2. Do not permit equipment installations on concrete until strength of concrete has reached 5000 psi.

H. Testing

1. Testing of concrete material will be done by the Port. 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.
2. Testing, as described above, will be at Engineer's discretion and in no way relieves the Contractor of any obligations.
3. Additional tests by the Port may include the following:
 - a. Additional testing and inspection required because of changes in materials, proportions, and procedures.
 - b. Additional testing of materials or concrete occasioned by their failure by

test or inspection to meet Specification requirements.

4. If any delivered load of concrete is rejected, dispose of completely off-site.
- I. Rejected Concrete
 1. Concrete not conforming with any portion of the specifications or concrete damaged from any cause and any concrete which shall be found defective at any time before the completion and acceptance of the work shall be removed and replaced.
 - J. Concrete trucks shall not be washed out onsite unless contained within a concrete wash-out area that complies with the requirements of the latest version of the Department of Ecology Stormwater Management Manual for Western Washington.

END OF SECTION

PART 1 – GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

- A. The provisions and intent of the Contract, including the General Conditions and General Requirements, apply to this work as if specified in this section. Work related to this section is described in:
 - 1. Section 03 30 00 – Cast-in-Place Concrete
 - 2. Section 09 96 00 – High Performance Coatings

1.02 DESCRIPTION OF WORK

- A. All metal fabrications are indicated on the Drawings and in the specifications. The work shall consist of furnishing all materials, labor, and equipment for fabricating and/or repairing, galvanizing, and erecting metal fabrications, in accordance with the Drawings, notes, and this specification.

1.03 REFERENCE STANDARDS

- A. American Institute of Steel Construction (AISC), Specification for Structural Steel Buildings, 2010.
- B. American Institute of Steel Construction (AISC), Code of Standard Practice for Steel Buildings and Bridges, 2010.
- C. American Society for Testing Materials (ASTM), Standard Specifications and Standard Test Methods, designated by basic reference in this section (use the most current edition at the time of bid unless otherwise indicated).
- D. American Welding Society (AWS) D1.1 – 2010, Structural Welding Code – Steel.
- E. American Welding Society (AWS) A2.4 – 2012, Standard Symbols for Welding, Brazing, and Nondestructive Examination.
- F. Society for Protective Coatings (SSPC), Surface Preparation Specifications.
- G. Washington Association of Building Officials (WABO) Standard No. 27-13, WABO Welder and Welding Operator Performance Qualification Standard for Structural Steel, Sheet Steel, and Reinforcing Steel.

1.04 QUALITY ASSURANCE

- A. Demonstrate that the fabricator has a minimum of five (5) years of experience fabricating and working similar metals and configurations, including cutting, bending, forming, welding, and finishing.
- B. Welders shall be currently certified by the Washington Association of Building Officials (WABO) for structural welding.
- C. Welding procedures, operations, welders, and tackers shall be qualified in accordance with AWS D1.1.
- D. The galvanized coating applicator shall specialize in hot-dip galvanizing after fabrication and follow the procedures in the AGA Quality Assurance Manual.

- E. Nondestructive testing (NDT) and inspection of all shop and field welds will be performed in accordance with AWS D1.1 by an independent testing agency retained by the Port. Welds failing to comply shall be repaired or replaced at the Contractor's expense.

1.05 SUBMITTALS

- A. Detailed and coordinated shop drawings indicating all shop and erection details, including cuts, copes, connections, holes, fasteners, material specifications, welds, surface preparations, and finishes.
- B. Documentation that the fabricator has the qualifications and experience described above.
- C. Welder qualifications and certifications.
- D. Weld Procedure Specifications (WPS's) proposed for use on the project. Submit supporting Procedure Qualification Records (PQR's) for all WPS's not prequalified by AWS.
- E. Galvanized coating applicator's Certificate of Compliance that the hot-dip galvanized coatings meet or exceed the specified requirements of ASTM A 123 or A 153, as applicable, and has followed the procedures in the AGA Quality Assurance Manual.
- F. Mill certificates for each heat number of structural and miscellaneous steel.
- G. Submit layout drawings and work plan for scaffolding or float system proposed to access under wharf work elements, including installation of conduit hanger system. The drawings and work plan shall address anticipated loads, proposed attachment or anchoring methods, method to accommodate tidal fluctuations, and access by workers and inspectors. The drawings shall bear the seal and signature of a licensed structural engineer registered in the State of Washington. Furnish stamped and signed copies of the design calculations to the Engineer.

PART 2 – PRODUCTS

2.01 GENERAL

- A. All products shall be new, free from oxidation, corrosion, and defects, and shall be of the specified quality.
- B. Protect all materials and fabrications before, during, and after installation from damage. Protect the installed work of other trades from damage.
- C. Protect painted coatings from damage by use of padded slings and straps.
- D. In the event of damage, immediately make all repairs and replacements as per the manufacturer's written recommendations and as approved by the Engineer at no additional cost to the Port.

2.02 MATERIALS

- A. Carbon Steel:
 - 1. General: All carbon steel items shall be hot-dip galvanized to the requirements of ASTM A123 to a thickness grade 100 unless noted otherwise in the Contract Documents.

2. Steel Shapes: All steel shapes shall meet the requirements of ASTM A36, unless otherwise noted on the Contract Documents.
3. Steel Plates: All steel plate shall meet the requirements of ASTM A36 Grade 50 unless otherwise noted on the Contract Documents.
4. Steel Plate and Bar for Vault Covers: All steel plate and bar for vault covers shall meet the requirements of ASTM A514 quenched and tempered low alloy steel.
5. Steel Pipes and Sleeves: All pipe columns, bollards, or supports, shall meet the requirements of ASTM A53, seamless, Grade B unless otherwise noted on the Contract Documents.
6. Hollow Structural Sections: All hollow structural sections (HSS) shall meet the requirements of ASTM A500 Grade B unless otherwise noted on the Contract Documents.

B. Stainless Steel:

1. All bolts, nuts, coupling nuts, and washers shall be stainless steel and meet the requirements of ASTM F593 & F594, Type 316 unless otherwise noted on the Contract Documents.
2. All threaded rods shall be stainless steel and meet the requirements of ASTM F593 Type 316L unless otherwise noted on the Contract Documents.
3. Threaded rod coupling nuts shall be capable of developing the yield and tensile strength of the connected threaded components unless otherwise noted on the Contract Documents.
4. Stainless steel plates shall meet the requirements of ASTM A240, Type 316L unless otherwise noted on the Contract Documents.
5. Stainless steel angles shall meet the requirements of ASTM A276, Type 316L unless otherwise noted on the Contract Documents.
6. Stainless steel strut components shall be as manufactured by UNISTRUT CORPORATION or approved equal unless otherwise noted on the Contract Documents.
7. Stainless steel channel members shall meet the requirements of ASTM A240, Type 316 unless otherwise noted on the Contract Documents.
8. Stainless steel hollow tube members (HSS) shall meet the requirements of ASTM A554, type 316L unless otherwise noted on the Contract Documents.

2.03 CONDUIT SUPPORT SYSTEM

- A. All components for the under-wharf conduit support system shall be stainless steel meeting the requirements of Article 2.02 B and 2.04 B in this Section, unless otherwise noted on the Contract Documents.

2.04 FASTENERS

- A. Carbon Steel

1. General: All carbon steel items shall be hot-dip galvanized to the requirements of ASTM A153 to a thickness grade 100 unless noted otherwise in the Contract Documents.
2. All machine bolts, steel-to-steel, shall meet the requirements of ASTM A307 for standard strength bolts and ASTM A325 or A490 for high-strength bolts unless otherwise noted on the Contract Documents.
3. All anchor bolts, steel to concrete, shall meet the requirements of ASTM F1554, Grade 36 unless otherwise noted on the Contract Documents.
4. All nuts shall be mechanically deposited galvanized after threading and shall meet the requirements of ASTM A563 unless otherwise noted on the Contract Documents.
5. All washers shall be galvanized and meet the requirements of ASTM F436 unless otherwise noted on the Contract Documents.
6. All Welded Headed Studs (WHS) shall be manufactured by Nelson Stud Welding, Inc., or equal. Refer to Article 2.05 of this Section for additional requirements.

B. Stainless Steel

1. All machine bolts, nuts (including nylon insert nuts), couplers and washers shall meet the requirements of ASTM F593 and F594 Type 316 unless noted otherwise on the Contract Documents.
2. All threaded rods shall meet the requirements of Articles 2.02 B2 and B3 of this Section.

C. Fastener Tightening

1. All carbon steel and stainless steel fasteners shall be snug-tightened.

2.05 WELDED HEADED STUDS (WHS)

- A. WHS used for anchoring embedments in concrete shall be provided to the diameter and length as shown on the Drawings. Welded headed studs shall be welded to the embedment or to other studs as shown on the Drawings.
- B. WHS for carbon steel embedments shall conform to ASTM A108, Grades C-1010 through C-1020, and shall be welded to the embedment prior to galvanizing. Welded headed studs for stainless steel embedments shall conform to ASTM A276 or A493.
- C. Welding, inspection, and testing of WHS to carbon steel fabrications shall be in accordance with the American Welding Society, AWS D1.1, Section 7. Welding, inspection, and testing of WHS to stainless steel fabrications shall be in accordance with AWS D1.6, Section 7.

2.06 OTHER MATERIALS

- A. All other materials not specifically described but required shall be proposed by the Contractor, new, free of corrosion, and subject to the approval of the Engineer.

PART 3 – EXECUTION

3.01 PREPARATORY REVIEW

- A. Prior to all work of this section, inspect the installed work of all other trades affecting this work and verify that all such work is complete to the point where this installation may commence.
- B. Coordinate and furnish placement drawings, templates, instructions, and directions for installation of embedded pipe sleeves and miscellaneous items.
- C. Verify that the work can be fabricated and installed in accordance with the Drawings, specifications, and reference standards. Immediately report discrepancies to the Engineer and do not proceed with fabrication or installation until discrepancies are resolved and direction is provided.

3.02 FABRICATION

- A. All structural steel shall be fabricated in accordance with the approved shop drawings and reference standards.
- B. Shop-fabricate and preassemble all items complete for installation to the extent practicable to minimize field assembly. Disassemble units only as necessary for shipping and handling limitations.
- C. Weld all shop connections unless otherwise directed on the Drawings. All joints shall be tightly fitting, securely fastened, square, plumb, straight, and true.
- D. Drill or punch all holes required for attachments and bolted connections including those of other trades. Burned holes are not acceptable.
- E. Welding of all metal fabrications shall conform to AWS D1.1.
- F. Install and erect all miscellaneous metal and metal fabrications in accordance with the design drawings, shop drawings, and reference standards.

3.03 ERECTION

- A. Erect and install all miscellaneous metal items in strict accordance with the Contract Drawings, the reviewed shop drawings, and the reference standards, aligning straight, plumb, and level within a tolerance of 1 in 200.
- B. Scaffolding and float systems used for accessing Work shall be in accordance with the following requirements:
 - 1. The installation of scaffolding and/or floats for any under wharf (or other work) shall not use any methods that cause damage to the existing piles. Installation of concrete anchor bolts or any other attachment mechanism that damages the surface of the piles is strictly prohibited. Attachment to any existing piling shall use friction collars or similar method that does not damage the surface of the concrete and does not require patching of the existing concrete. Any damage to existing surfaces shall be repaired, to the satisfaction of the Engineer, at no cost to the Port.

3.04 PROTECTIVE COATINGS

- A. All miscellaneous carbon steel metal, metal fabrications, and fasteners, except as noted in this specification, shall be hot-dip galvanized in conformance with ASTM A 123, A 143, A 153, A 384, and A 385, as applicable.
 2. All miscellaneous carbon steel metal, metal fabrications, and fasteners that have a galvanized coating, and are to be further coated (painted), shall be cleaned, prepared, primed, and coated with additional coatings over the galvanized coating as specified in Section 09 96 00 – High Performance Coatings.
 3. Identify proposed drain holes or vent holes required to produce galvanized coatings to the specified standards. Clearly locate these holes on the shop drawings.
 4. Galvanize items, to the extent practicable, immediately after fabrication is complete.
 5. Damaged galvanizing, including damage due to welding, shall be restored in accordance with ASTM A 780, annex A3. Zinc-rich paints and cold spray materials are not acceptable. Surface preparation and application shall be according to the manufacturer's specifications.
- B. The following metal fabrications shall be galvanized and coated as specified in Section 09 96 00 – High Performance Coatings.
1. Walking surfaces of shore power vault (cold ironing) lids and frame
- C. The following metal fabrications shall be coated only as specified in Section 09 96 00 – High Performance Coatings (not galvanized).
1. Traffic bollards
 2. Traffic bollard guardrails

END OF SECTION

PART 1 – GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

- A. The provisions and intent of the Contract, including the General Conditions and General Requirements, apply to this work as if specified in this section. Work related to this section is described in:
 - 1. Section 00 26 00 – Substitution Procedures
 - 2. Section 05 55 00 – Metal Fabrications

1.02 DESCRIPTION OF WORK

- A. The work includes furnishing all materials, labor, equipment, and accessories for preparing and providing the required finished painting and protective coatings on the fabrications and items identified on the drawings and in the specifications. See Section 05 50 00 for list of project components to receive high performance coating.

1.03 REFERENCE STANDARDS

- A. Society for Protective Coatings (SSPC), SSPC Painting Manual, Volume I, 4th Edition, “Good Painting Practice”.
- B. SSPC Painting Manual, Volume II, 2008 Edition, “Systems and Specifications”.
- C. SSPC, “The Fundamentals of Cleaning and Coating Concrete”.
- D. SSPC, “Procedure for Determining Conformance to Dry Coating Thickness Requirements”, SSPC-PA2.

1.04 QUALITY ASSURANCE

- A. Coating application shall be by qualified and experienced personnel having demonstrated at least five (5) years of experience in coating applications for marine structures.
- B. Conform to all manufacturers’ specifications and recommendations for achieving published results with each product, application, and condition. If manufacturers’ specifications or recommendations differ from those in these specifications, report the discrepancy to the Engineer and obtain further direction before proceeding.
- C. The Engineer may inspect coating preparation, application, or touchup at its discretion. Provide access to the Engineer for these inspections and at no additional cost to the Port.

1.05 SUBMITTALS

- A. A complete list of products and product descriptions proposed for use as coating systems.
 - 1. Provide manufacturer product data and accessories, including specifications, physical characteristics, and performance data.

2. Manufacturer instructions and directions for application of the coating systems.
 3. Manufacturer instructions and procedures for use in performing field repairs and touch-ups to the coating systems.
 4. Use the same manufacturer's products for all coats unless otherwise approved by the Engineer.
- B. Documentation that key personnel of the coating applicator have at least the minimum experience and certifications described above and below. Demonstrate consistent experience applying the proposed coating systems under similar conditions. List information by individual and include the following.
1. Position or responsibility
 2. Employer (if other than the Contractor)
 3. Name of facility owner
 4. Mailing address and telephone number of facility owner
 5. Name of contact reference in facility owner's organization
 6. Location, size, and description of structure
 7. Dates work was performed
 8. Description of work performed on structure
- C. Samples of all paints and finishes proposed for use.
- D. Schedule of coating operations with dates and items listed.
- E. Measurement reports of dry paint thickness on metal surfaces according to SSPC-PA2.

1.06 PRODUCT HANDLING

- A. Deliver paint and associated materials in undamaged and unopened containers bearing labels of the manufacturer, which indicate the contents and directions for use, storage, and handling. Store materials in a location where the ambient temperature and humidity is not outside the ranges recommended by the manufacturer.
- B. Prevent fire. Open containers of inflammable materials only as needed. Keep rubbing cloths, oily rags, etc., in tightly closed metal containers, or remove from the job site daily. Benzene, gasoline, or distillates shall not be stored on the job site.
- C. Do not damage the coating materials before, during, or after installation and prevent damage to the installed work and materials of other trades.
- D. In the event of damage, immediately make all repairs and replacements as directed by the Engineer according to the manufacturer's recommendations and procedures at no additional cost to the Port.

PART 2 – PRODUCTS

2.01 COATING SYSTEMS

- A. Manufacturers who have provided acceptable coating systems for past marine projects include the following. This does not imply that products from any manufacturer listed below will be acceptable.
 - 1. Carboline Protective Coatings (1-206-243-6494)
 - 2. International Marine Coatings of AkzoNobel (1-206-763-8003),
 - 3. Sherwin Williams Co Industrial and Marine Coatings (1-360-931-4645)
 - 4. Tnemec Company (1-206-762-5755)
 - 5. Wasser High-Tech Coatings (1-253-218-2222)
 - 6. Fields Company LLC (1-253-627-4098)
- B. Coating systems selected for each type of finish surface shall be products of a single manufacturer. Coating materials shall be suitable for corrosion protection in an aggressive marine environment.
- C. Materials not specifically noted but required for the work, such as thinners, or other materials, shall be products of the approved paint manufacturer or compatible products accepted by the coating manufacturer.
- D. Paint products for coating systems shall be mixed according to the manufacturer's directions. Do not deviate except with written approval of the Engineer.

2.02 SUBSTITUTIONS

- A. Manufacturer-specific coating systems are referenced in this specification. The manufacturer's product identification numbers indicate the product type, quality, and performance required for a specific application. Bids shall be based upon the manufacturer-specific coating systems referenced herein.
- B. Submit in writing a request to the Engineer for review and approval prior to material procurement and in accordance with Section 00 26 00 – Substitution Procedures. Substantiating technical data and documentation are required as described above for all submittals.
- C. Proposed coating system substitutions will be reviewed and evaluated, subject to the approval of the Engineer, based on equivalency to the coating systems referenced in this herein. Substitute coating system data and documentation that does not demonstrate equivalency will not be approved.
- D. Approved substitutions shall be at no additional cost to the Port.

2.03 COLOR SCHEDULE

- A. OSHA safety yellow:
 - 1. Traffic bollards and guardrails.
- B. Standard gray with non-skid coating on walking surfaces and OSHA safety red lettering (letterings shall be as indicated on drawings):

1. Shore power vault (cold ironing) lids

2.04 COATING SCHEDULE

- A. Galvanized metal surfaces that are indicated in Section 05 50 00 – Metal Fabrications to be coated (painted) shall be coated as follows:
 1. Solvent cleaned to remove contaminants using a biodegradable, water soluble, cleaner in conformance with SSPC-SP1.
 2. Solvent cleaned galvanized surfaces shall receive a light, sweeping abrasive sand blast to create a toothed surface profile in accordance with SSPC-SP7.
 3. Primer: Intergard 345 epoxy primer by International Marine Coatings of AkzoNobel, applied to a minimum dry film thickness of 5 mils on all surfaces.
 4. Top coat: Intergard 345 epoxy primer by International Marine Coatings of AkzoNobel, applied to a minimum dry film thickness of 5 mils on all surfaces.
 5. Non-skid coating: Intergard 631 epoxy non-skid deck finish EK 6312A by International Marine Coatings of AkzoNobel, applied to a minimum dry film thickness of 40 mils on specified surfaces.
- B. Metal surfaces that are indicated in Section 05 50 00 – Metal Fabrications to be coated (painted) shall be coated as follows:
 1. Solvent cleaned to remove contaminants using a biodegradable, water soluble, cleaner in conformance with SSPC-SP1.
 2. Primer: Intergard 345 epoxy primer by International Marine Coatings of AkzoNobel, applied to a minimum dry film thickness of 5 mils on all surfaces.
 3. Top coat: Intergard 345 epoxy primer by International Marine Coatings of AkzoNobel, applied to a minimum dry film thickness of 5 mils on all surfaces.

PART 3 – EXECUTION

3.01 GENERAL

- A. Apply paints and coatings in accordance with the manufacturer's recommendations for each application. Adhere to the manufacturer's provisions, directions, and procedures for the following.
 1. Surface preparation
 2. Ambient temperature and humidity monitoring
 3. Mixing techniques
 4. Method of product application
 5. Minimum and maximum thickness per coat to achieve total thickness

6. Minimum time between coats

- B. Use clean equipment and brushes. Spread materials evenly without runs, drips, sags, laps, brush marks, variations in color, texture, or sheen, and without “holidays”.
- C. Vary color or sheens between coats and apply all coats to uniform thicknesses. Refinish any work determined defective or damaged, and repair all defective or damaged work at no additional cost to the Port. Leave finished surfaces clean, completely covered, and uniform in appearance.

3.02 APPLICATION

- A. Number of coats as specified herein.
- B. Thickness of coats: Use ample undiluted materials; apply in uniform thickness over entire areas; do not exceed manufacturer’s recommended spreading rate per gallon.
- C. Tint prime coats if necessary to obtain uniform finish coats.

3.03 TOUCHUP PAINTING

- A. Paint film damaged due to field welding or other Contractor activities shall be immediately restored to its original thickness after thorough cleaning and necessary surface preparation according to the written manufacturer’s recommendations.
- B. Touchup painting shall be at the Contractor’s expense.

3.04 INSPECTION

- A. The Contractor shall perform measurements of dry paint thickness on all metal surfaces by means of magnetic gages as described in SSPC-PA2.
- B. Copies of the measurement reports shall be provided to the Engineer prior to delivery.
- C. The Engineer will perform verification testing/inspection at the Port’s expense. The Contractor shall make arrangements for these tests/inspections at all facilities performing coating applications and give the Engineer a notice at least 14 days in advance of each coating operation.

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 are described in the following sections:
 - 1. Section 01 33 00 – Submittal Procedures
 - 2. Section 26 05 13 – Medium Voltage Cable and Accessories
 - 3. Section 26 05 19 – Low Voltage Electrical Power Conductors and Cables
 - 4. Section 26 05 73 – Overcurrent Protective Device Coordination Study
 - 5. Section 26 09 99 – Commissioning of Electrical Systems
 - 6. Section 26 12 16 - Medium Voltage Power Substations
 - 7. Section 26 24 16 – Panelboards
 - 8. Section 26 27 26 – Wiring Devices
 - 9. Section 26 28 00 – MV Automatic Power Factor Correction Capacitors
 - 10. Section 26 90 11 – High Voltage Shore Power Receptacles
 - 11. Section 33 77 00 - Medium Voltage Shore Power Switches in Walk-In Enclosures
 - 12. Section 33 79 00 – Site Grounding

1.02 SUMMARY

- A. This Section includes requirements for acceptance testing by the Contractor and testing required to be completed by the Contractor retained Independent Testing Agency. This work includes Functional Acceptance Testing of each receptacle utilizing load banks as described further herein.
- B. Contractor shall furnish all labor, equipment, materials, test power and incidentals necessary to perform complete electrical field inspection and testing on all electrical equipment and other electrical Work as indicated on the drawings and as specified in these specification sections. Unless otherwise waived in writing, test power for all testing and commissioning shall be provided by Contractor-furnished generators.
- C. Certain testing as described and/or required by other Sections of Division 26, Electrical shall conform to this Section except as specifically exempted or modified or waived in writing.
- D. Related Documents: The provisions and intent of the Contract, the General and Division 1 Specification Sections, apply to the Work as if specified in this Section.

1.03 APPLICABLE PUBLICATIONS/CODES/REFERNCES

- A. The Contractor shall comply with provisions of all local, State, and Federal codes, specifications, standards, and recommended practices, except as otherwise indicated.
- B. All inspections and tests shall be in accordance with the following applicable standards and codes. These publications form a part of this specification to the extent referenced.

1. Institute of Electrical and Electronic Engineers (IEEE):
 - a. 81 Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System.
 - b. 400 Guide for Making High-Direct-Voltage Tests on Power Cable Systems in the field.
2. American Society for Testing and Materials (ASTM):
 - a. D877 Dielectric Breakdown Voltage of Insulating Liquids Using Disk Electrodes.
3. Insulated Cable Engineers Association (ICEA):
 - a. S-19-81 Rubber Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
4. National Electrical Manufacturers Association (NEMA):
 - a. WC3-1992 Rubber Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
5. National Electrical Code – NEC
6. American National Standards Institute - ANSI
7. National Fire Protection Association - NFPA
8. Occupational Safety and Health Administration - OSHA 29CFR Part 1910.269
9. InterNational Electrical Testing Association – NETA
NETA ATS – Acceptance Testing specifications of Electrical Power Distribution Equipment and Systems (NETA ATS)
10. Nationally Recognized Testing Laboratory - NRTL
11. State of Washington Administrative Code – WAC
12. Use Manufacturer’s instruction manuals applicable to each particular apparatus for special inspection and testing requirements.

1.04 TESTING FIRM AND PERSONNEL QUALIFICATIONS

A. Under supervision of the Contractor:

1. The Contractor shall include costs in the bid proposal to engage the services of an independent Testing Agency, which can function as an unbiased testing authority, professionally independent of the manufacturers, suppliers, and installers of systems being evaluated, and regularly engaged in the testing of similar electrical equipment, devices, installations, and systems.
2. The independent Testing Agency shall provide final inspection, testing, calibration, and adjusting on the electrical distribution system as defined in this section. The independent Testing Agency shall have been engaged in full practice of similar electrical systems testing for a minimum of five (5) years, including vessel shore power systems, or similar emergency generators’ load bank testing.

3. The independent Testing Agency shall comply with all Federal, State, and local regulations and codes as well as site-specific safety procedures and requirements.
 4. The independent Testing Agency shall be a member of the International Electrical Testing Association (NETA).
 5. The independent Testing Agency shall have a calibration program with accuracy traceable every six months, and in unbroken chain, to the National Institute of Standards and Technology (NIST).
 6. The independent Testing Agency shall have a designated safety representative on the Project. The safety standards shall include OSHA, WISHA, and NFPA 70E and other applicable Standards.
 7. Testing, inspection and calibration shall be performed by an Engineering Technician with a minimum of five (5) years of experience inspecting, testing, and calibrating similar electrical distribution equipment, systems and devices. The independent Testing Agency and Technician qualifications shall be submitted to the Engineer for review thirty (30) calendar days prior to the start of work.
 8. The independent Testing Agency shall confirm that all check items, and testing are performed before placing any equipment in operation.
 9. The independent Testing Agency shall be responsible for arranging and conducting the testing per the acceptable project schedule.
 10. The independent Testing Agency shall be responsible for maintaining the individual test sheets and the project master test schedule. These documents shall be maintained in an up-to-date condition and are subject to review by the Engineer at any time.
 11. All components with test results that fall outside the acceptable NETA ATS range and individual measurements that fall outside the average of like measurements by 25 percent difference shall be immediately brought to the Engineer's attention.
 12. The independent Testing Agency shall give not less than five (5) calendar days-notice before any required witnessed test.
 13. The independent testing organization shall meet Washington State Department of Labor and Industries criteria for accreditation of testing laboratories, for electrical product testing.
- B. Testing Agency's Field Supervisor Qualifications: A person, regularly employed by the firm for testing services and currently certified by the International Electrical Testing Association (NETA) to supervise on-site testing specified.
- C. Contractor shall submit testing firm qualifications to the Engineer for their review of qualifications for items to be tested.

1.05 SYSTEM DESCRIPTION

- A. The Contractor is responsible for equipment, function and system acceptance testing of all equipment and cabling provided.

1. The Contractor shall have all testing completed by the qualified independent Testing Agency. The Contractor shall submit proof of qualifications of the independent Testing Agency.
2. Changes in the project that add equipment or cabling shall include applicable testing.
3. The manufacturers of the 15kV substations, walk-in enclosures, and shore power boxes/receptacles shall provide field technical start-up personnel and work under the Contractor's jurisdiction. Work includes all systems as shown on the drawings and as described in these specifications. Contractor shall provide all start-up of all equipment by manufacturer's field technicians.

1.06 GENERAL REQUIREMENTS AND SUBMITTALS

- A. Submit under provisions of Section 01 33 00, "Submittal Procedures" for submittal procedures.
- B. Submit a testing schedule of equipment acceptance, equipment functional and system functional tests not less than thirty (30) calendar days prior to commencing the first test or group of tests. Update and submit revised testing schedules not less than fourteen (14) calendar days before execution of the revised schedule. Schedule shall include a listing of tests as well as dates the tests are to be performed. All final electrical engineering calculations and reports shall bear the signature and stamp of a Washington State Registered Professional Engineer.
- C. Submit Qualifications for:
 1. Power system analysis firm (per Section 26 05 73 - Overcurrent Protective Device Coordination Study), not more than sixty (60) calendar days after Notice to Proceed.
 2. Independent Testing Agency and technicians assigned to the project. Not less than sixty (60) calendar days prior to testing.
- D. General Scope: Engage the services of a recognized independent Testing Agency for the purpose of performing quality control inspections and tests as herein specified.
 1. The Testing Agency shall provide all material, equipment, labor and technical supervision to perform all tests and inspections to determine suitability of equipment for energization and continued reliable operation.
 2. The purpose of these tests is to assure all tested electrical equipment is operational within industry and manufacturer's tolerances and equipment is installed and functioning in the system in accordance with design specifications of the Engineer.
 3. The independent Testing Agency (not the Contractor) shall inspect and test the following:
 - a. Low voltage conductors (600V and below).
 - b. Ground resistance at new and revised wiring, and electrical service ground tests at the new medium voltage substations and Walk-in-Enclosures.

- c. Inspection of exothermic welds of the “Ground Grid” at the new medium voltage substations, and walk-in enclosure, and the molds for the exothermic welds.
 - d. Medium Voltage 15kV Cables.
 - e. Ground-fault monitors. See specification Section 33 77 00 “Medium Voltage Shore Power Switches in Walk-In Enclosures”, 2.05.A.8. Ground fault protection system tests.
 - f. Medium Voltage 15kV circuit breakers and relays. Breaker settings shall be as provided by 26 05 73 Overcurrent Protective Device Coordination Study.
 - g. Medium Voltage Substations (15kV main service switch, 15kV switchgear, transformer primary and secondary protection, substation transformer, protective relays, and controls).
 - h. Medium Voltage Walk-In Enclosures (15kV Main and Capacitor breakers, shore power disconnects switches, HMI, PLC, protective relays and controls).
 - i. Automatic Power Factor Correction Capacitor Banks (disconnect switch, 6.6kV capacitor bank, automatic controls, relays, instrument transformers).
 - j. Shore Power Connection Boxes and 6.6kV shore power receptacles.
 - k. Phase rotation tests (coordinate with Tacoma Public Utilities).
 - l. Final shore power Functional Acceptance tests as described in Paragraph 1.15 of this specification section.
- E. Submittals by the independent Testing Agency:
- 1. Field Test Reports: Maintain a written record of all tests. Assemble and certify a final test report upon completion of the project, showing dates, personnel making tests, equipment used, material tested, tests performed, and test results. The field test forms included in the report shall be the original hand-written test results that were recorded and signed by the individual(s) who performed the testing.

1.07 DIVISION OF RESPONSIBILITY

- A. The Contractor shall perform routine insulation-resistance and continuity tests for all utilization equipment prior to, and in addition to tests performed by the independent Testing Agency.
- B. The Contractor shall supply a suitable and stable source of electrical power to each test site. The independent Testing Agency shall determine the specific power requirements.
- C. The Contractor shall notify the independent Testing Agency when equipment becomes available for acceptance tests. Coordinate work to expedite project scheduling.
- D. The Contractor shall supply a short-circuit and protective device coordination study, a protective device setting form, a complete set of electrical drawings and specifications, and any pertinent change orders to the independent Testing Agency prior to commencement of testing.
- E. The Contractor shall coordinate with the independent Testing Agency, that will perform the short circuit, coordination, and arc flash study, and submit to the Engineer all Arc

Flash labels for review and approval. After approval by the Engineer, the Contractor shall obtain all Arc Flash labels and install them on all electrical equipment.

- F. The independent Testing Agency shall notify the Engineer prior to commencement of any testing.

1.08 SAFETY

- A. The Contactor shall adhere to safety procedures as required by the following:
 - 1. Occupational Safety and Health Act (OSHA).
 - 2. Washington Industrial Safety and Health Act (WISHA)
 - 3. Accident Prevention Manual for Industrial Operations, National Safety Council.
 - 4. ANSI/NFPA 70E, Electrical Safety Requirements for Employee Workplaces.
 - 5. American National Standards for Personnel Protection: Lockout/Tagout.
 - 6. Applicable state and local safety operating procedures.
- B. Perform all tests with apparatus de-energized, except where specifically required.
- C. Designate a Project Safety Representative to supervise operations with respect to safety.

1.09 DEFINITIONS:

- A. The Contractor shall perform tests of the electrical system to assure code compliance and proper system operation according to the intent of the contract documents.
 - 1. Check: Visual review of equipment or an appropriate equipment operation as defined or described by the equipment manufacturer's installation instructions to verify general conformance with the Drawings and Specifications.
 - 2. Inspect: A detailed physical inspection of equipment to verify conformance to Drawings and Specifications
 - 3. Equipment Acceptance Test: Application of an external power or energy source or test equipment to prove the integrity of the specified unit or system.
 - 4. Equipment Functional Test: A complete operational check of the equipment as finally assembled where the equipment is received in sections and/or components of the equipment requires field settings or adjustments.
 - 5. System Functional Acceptance Test: A complete operational check of the entire system.

1.10 CIRCUIT TESTS:

- A. Perform routine insulation resistance, continuity and grounding tests for all utilization equipment prior to their connection and energization.
- B. A standard megger-type instrument shall be used to demonstrate insulation values are above the minimum values as specified in NETA Acceptance Testing Specifications for the applicable voltage rating, ground system is continuous and the neutral system is isolated from the grounding system except at the systems' single ground point.
- C. System defects, indicated by the circuit tests, shall be corrected. Tests shall be repeated until satisfactory results are obtained.

1.11 GROUNDING TEST:

- A. Measure the ohmic value of the Electrical Service Entrance “System Ground”, and the “Ground Grid” at the new Substations and walk-in enclosures 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. Notify the Engineer if this resistance value is not obtained for the initially installed system; and then provide corrective measures required to reduce ground resistance to less than 10 ohms.

1.12 PHASE ROTATION TEST:

- A. Coordinate with TPU for phase rotation tests.

1.13 GROUND FAULT PROTECTION SYSTEM TEST:

A. Visual and Mechanical Inspection

- 1. Inspect neutral main bonding connection to assure:
 - a. Zero sequence is grounded upstream of sensor.
 - b. Ground connection is made ahead of neutral disconnect link.
- 2. Inspect control power transformers to insure adequate capacity for system.
- 3. Monitor panels (if present) shall be manually operated for:
 - a. Trip-test
 - b. No trip-test
 - c. Non-automatic reset
 - d. Proper operation and sequence shall be recorded.
- 4. Zero sequence systems shall be inspected for symmetrical alignment of core balance transformers about all current carrying conductors.
- 5. Ground fault device circuit nameplate identification shall be verified by device operation.
- 6. Pickup and time delay settings shall be set in accordance with Overcurrent Protective Device Coordination Study.

B. Ground Fault System Electrical Tests

- 1. System neutral insulation resistant shall be measured to ensure no shunt ground paths exist, neutral-ground disconnect link shall be removed, neutral insulation resistance measured and link replaced.
- 2. The relay pickup current shall be determined by current injection at the sensor and the circuit interrupting device operated.
- 3. The relay timing shall be tested by injecting one hundred fifty percent (150%) and three hundred percent (300%) of pickup current into sensor. Total trip time shall be electrically measured.
- 4. System operation shall be tested at fifty-five percent (55%) rated voltage.

5. Zone interlock systems shall be tested by simultaneous sensor current injection and monitoring zone blocking function.
- C. Test Parameters
1. System neutral insulation resistance shall comply with applicable industry standards.
 2. Relay pickup current shall be within ten percent (10%) of device dial or fixed setting.
 3. Relay timing shall be in accordance with manufacturer's published time-current characteristic curves.
- D. For Ground Fault System Testing, Contractor shall retain the services of a NETA member firm, or a firm approved by the Engineer.
- E. Apply label certifying satisfactory test completion in accordance with NETA Labeling Procedure.

1.14 CABLE TESTS – MEDIUM VOLTAGE

- A. Visual and Mechanical Inspections
1. Inspect exposed section for physical damage.
 2. Verify cable is supplied and connected in accordance with single line diagram.
 3. Inspect shield grounding, cable support, and termination.
 4. Visible cable bends shall be checked against ICEA or manufacturer's minimum allowable bending radius.
 5. Inspect for proper fireproofing in common cable areas.
- B. Electrical Tests
1. Testing of the medium voltage cables shall be per the latest edition of IEEE 400 Standard for the type of cable specified.
- C. Test Values – Visual and Mechanical
1. Compare bolted connection resistance values to values of similar connections. Investigate values which deviate from those of similar bolted connections by more than 50 percent of the lowest value.
 2. Bolt-torque levels should be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use NETA Acceptance Testing Specifications Table 100.12.
 3. Results of thermographic survey shall be in accordance with NETA Acceptance Testing Specifications, Section 9.
 4. The minimum bend radius to which insulated cables may be bent for permanent training shall be in accordance with NETA Acceptance Testing Specifications Table 100.22.
- D. Test Values – Electrical

1. Compare bolted connection resistance values to values of similar connections. Investigate values which deviate from those of similar bolted connections by more than 50 percent of the lowest value.
 2. Insulation-resistance values shall be in accordance with manufacturer's published data. In the absence of published data, use NETA Acceptance Testing Specifications Table 100.1. Values of insulation resistance less than this table or manufacturer's recommendations should be investigated.
 3. Shielding shall exhibit continuity. Investigate resistance values in excess of ten ohms per 1000 feet of cable.
 4. If no evidence of distress or insulation failure is observed by the end of the total time of voltage application during the dielectric withstand test, the test specimen is considered to have passed the test.
 5. Based on the test methodology chosen, refer to applicable standards or manufacturer's literature for acceptable values.
- E. Functional Test Plan shall include the components and devices of the following systems and verification all systems perform in accordance with the Contract Documents:
1. Medium Voltage Substations and Walk-in Enclosures
 2. Protective relays and controls
 3. Control Circuits
 4. Switchgear 15kV and 6.6kV bus phase rotation
 5. Power metering system
 6. Key interlock system
 7. Walk-In Enclosures power, data, and equipment status data network, copper data cable, fiber optic cable, fiber optic transmission/conversion equipment.
 8. Shore-to-Ship power receptacle assemblies and power phase sequence test
 9. Grounding, transformer neutral ground check, Shore Power boxes continuity check systems.
 10. Programmable Logic Controllers (PLC), and Human Machine Interface (HMI) monitors.
 11. Shore power phase sequencing at Shore Power vaults.
- F. Test and Analysis Reports:
1. Submit a preliminary copy of the test results to the engineer no more than seven (7) calendar days after the tests are completed. Submit certified copies of each field test report for Engineer review before energizing circuits and equipment. Field test reports shall be certified by a State of Washington Registered Professional Electrical Engineer to be complete and accurate. Certification shall include a letter listing all tests performed, and test reports, are complete and accurate and with signed, and dated Professional Electrical Engineer seal by the reviewing engineer.

2. Submit the final report no later than thirty (30) calendar days after completion of Acceptance Testing. The final report shall include the following information:
 - a. Summary of the project, description of the equipment and materials tested, visual inspection report, description of the tests, test results, conclusions, recommendations, and a statement that all corrections have been made.
 - b. Incorporate field test reports for all cable tests and grounding system tests. Provide an appendix including test reports, and identification of the test equipment used.
 - c. Secure final report and test documents together using index tabs, and table of contents in a 3-ring binder. Provide one (1) 3-ring binder with original reports and one (1) 3-ring binder with copies. Also provide an electronic deliverable in PDF format.

1.15 6.6kV SHORE-TO-SHIP POWER SYSTEM FUNCTIONAL ACCEPTANCE TESTS

- A. The Contractor shall provide all equipment, labor, and materials necessary to perform a load test to each Shore-to-Ship power receptacle outlet assembly for both Pier 3 and Pier 4 (total of six receptacle outlet assemblies). The Contractor shall furnish a portable load test system (load bank, transformer, cables, etc.) capable of continuous operation at 2,000 kW (2.0MW), unity power factor and 6.6kV. The Contractor shall coordinate with Engineer and Terminal Vessel schedule to locate all load test equipment in close proximity to the shore power receptacle being tested. The Contractor shall coordinate testing with the Engineer, and Terminal Operator (Tenant). The Contractor shall assume that work shall be performed on Saturdays or Sundays between 7:00 am and 8:00 pm, unless alternate days and times are coordinated and approved by the Engineer.
- B. The Contractor shall furnish, and the Testing Agency shall install cables, transformers, and load banks required to conduct and perform load tests. The Testing Agency shall begin each load test by stepping quickly (two-second pause between steps) in 200kW steps to 600kW. The Testing Agency shall hold the load at 600kW for two (2) minutes. Then the Testing Agency shall increase the power by steps up to 800kW, 1,000kW, 1,400kW, 1,800kW at two (2) minutes each step, and up to 2,000kW for five (5) minutes, for a total load test of fifteen (15) minutes.
- C. The Testing Agency shall record voltage, current, power demand (kW) and energy (kWh) use for each shore power receptacle test. The Testing Agency shall record the shore power receptacle voltage and current at no load, then at 600kW, 800kW, 1,000kW, 1,400kW, 1,800kW and 2,000kW load. The Testing Agency may use calibrated switchgear power meters for the energy use records.
- D. The Contractor shall provide the plugs that match the stationary shore power receptacles. The Contractor shall provide two (2) plugs at each shore power receptacle location. The Contractor shall provide plugs equipped with wire pigtails, a minimum of fifteen (15) feet in length, three (3) 8kV insulated and shielded phase conductors and two pilot/control 600V insulated conductors. The Testing Agency shall connect the 8kV conductors to the load bank transformer. The Testing Agency shall connect the control conductors to an external test switch to simulate pilot wire open/close conditions.

- E. The Testing Agency shall check operation of the shore power receptacle “continuity check circuit” by opening the shore power receptacle plug switch and verifying circuit breaker trip.
- F. The Testing Agency shall check and verify the shore power receptacle conductor phasing and rotation are correct using 6.6kV terminal connections at the load bank transformer as test points. The Testing Agency shall visually verify the conductors between the plug connections and the transformer connections.
- G. All tests and inspections visual or otherwise shall be documented, including:
 - 1. Tester’s name
 - 2. Test equipment with serial number
 - 3. Date
 - 4. Items tested
 - 5. Test results
 - 6. Acceptance criteria
 - 7. Corrective work
 - 8. Witnesses
 - 9. Torque testing of bolted connections

1.16 EQUIPMENT AND SYSTEMS FUNCTIONAL TESTING (NETA SECTION 8)

- A. Equipment and system functional tests shall be performed upon completion of the equipment acceptance tests on specific equipment or systems in Paragraph 1.06B3 to prove the correct interaction of all sensing, processing, and action devices.
- B. The Contractor shall develop test parameters including a written test plan and perform the tests for the purpose of evaluating performance and safety features of all integral components and their functioning as a complete unit or system, within design requirements and manufacturer’s published data. As a minimum all tests shall:
 - 1. Verify the correct operation of all interlock safety devices for fail-safe functions in addition to other design functions.
 - 2. Verify the correct operation of all sensing devices, alarms, and indicating devices.
- C. Each written Functional Test Plan shall include as a minimum:
 - 1. Description of the system to be tested including:
 - a. A list of test equipment to be used
 - b. A list of installed equipment to be operated
 - 2. A description of Key Safety Requirements:
 - a. Describe safety features
 - b. Describe an appropriate attempt to defeat a Key Safety feature

- c. Describe how a defeat is prevented in normal operation and/or where there are intentional defeater features, such as bypass or interlock overrides.
3. A description of each test step

1.17 RESPONSIBILITY

- A. The Contractor is responsible for Acceptance Testing and Functional Testing of all equipment, devices, cabling, and systems provided.
 1. The Contractor shall coordinate the Work with the Engineer and Port to expedite project scheduling including scheduling of Tacoma Public Utilities required to witnessing certain testing.
 2. The Contractor shall have equipment and device Acceptance Testing completed by the independent Testing Agency.
 3. Contractor's insurance coverage shall cover the independent Testing Agency.
 4. Changes in the project that add equipment or cabling shall include applicable testing for equipment or cabling added.
 5. The Contractor shall notify the Engineer and the independent Testing Agency when equipment becomes available for testing.
 6. The Contractor shall notify the Engineer prior to commencing of any testing.
 7. The Contractor and the independent Testing Agency shall be responsible to complete all tests and re-tests after corrections are made for failed tests.
- B. Safety and Precautions:
 1. Safety practices shall include, but not limited to the following requirements:
 - a. OSHA
 - b. WISHA
 - c. Accident Prevention Manual for Industrial Operations, National Safety Council
 - d. Applicable State and Local safety operating procedures
 - e. NFPA 70E
 - f. American National Standards for Personnel Protection
 2. The independent Testing Agency shall provide a designated safety representative on the project to supervise the testing operations with respect to safety.
 3. Testing shall be performed with apparatus de-energized. Exceptions must be thoroughly reviewed to identify safety hazards and devise adequate safeguards.
 4. The Contractor shall ensure appropriate Personnel Protective Equipment (PPE) is used during testing when systems are energized. Appropriate PPE shall be used to work at energized equipment and circuits.
 5. Provide and use safety devices such as rubber gloves and blankets, protective screen, barriers and danger signs to adequately protect and warn all personnel in the vicinity of the tests.

6. The Contractor shall enforce safe Lock-Out, Tag-Out practices.

C. Care and Precautions:

1. The Contractor is responsible for any damage to equipment or material due to improper test procedures or test apparatus handling. Contractor shall replace or restore to original condition any damaged equipment or material.

PART 2 - PRODUCTS

2.01 TEST EQUIPMENT

- A. Utilize test equipment in good mechanical and electrical condition with shape and frequency output waveforms appropriate for the test and the tested equipment.
 1. Accuracy shall be appropriate for the test being performed, but not in excess of 2% of the scale being used.
- B. Field test meters used to check installed power system instrument calibration must have an accuracy higher than the instrument being checked.

2.02 TEST INSTRUMENTS AND CALIBRATION

- A. The Testing Agency shall have a calibration program which assures all applicable test instruments are maintained within rated accuracy as dictated by the National Institute of Standards and Technology (NIST).
 1. Instruments calibration schedule:
 - a. Field instruments: Analog, 6 months maximum; Digital, 12 months maximum
 - b. Laboratory instruments - 12 months.
 - c. Leased specialty equipment - 12 months (where lessor guarantees accuracy).
 2. Provide visible dated calibration labels on all test equipment.
 3. Maintain up-to-date instrument calibration instructions and procedures for each test instrument.
- B. Provide all testing equipment required including, but not limited to, the following:
 1. 500V, 1000V and 15kV meggers.
 2. Wet and dry-bulb thermometer.
 3. Battery-powered portable telephone sets
 4. Test equipment for testing medium voltage cable to be compatible with the cable and testing method used.
 5. Multimeter (Volts-Ohms-Millimeter) rated 20k ohms per volt or higher.
 6. Three-phase rotation meter, 60-Hz.
 7. Commercial model three-point earth ground test set reading directly in ohms.
 8. Miscellaneous cable, test leads, jumpers, test lights, buzzers, bells, switches, plugs, receptacles, and other test equipment as required.

9. Insulation Tester (Megger): 2,000 Megohms
10. Dranetz, BMI Model 355, Fluke 41 or equivalent recording type harmonic analyzer to display individual and total harmonic currents and voltages.
11. Clamp-on Ammeter.
12. Circuit breaker Current Injections Test Set.
13. Load banks as described in Paragraph 1.15.A of this specification section.

2.03 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 independent testing by the Testing Agency in the bid proposal.

2.04 TEST REPORT(S):

- A. Furnish minimum two (2) bound copies of test reports, as specified herein, for inclusion into the project operation and maintenance manuals. Contractor shall also provide electronic deliverables in PDF format. Each test report shall include the following items:
 1. Name, address and telephone number of the testing agency.
 2. Name(s) of personnel conducting the tests
 3. Summary of project
 4. Description of equipment tested
 5. Description of test procedure
 6. List of items tested
 7. List of actual test equipment including make, model(s), serial number(s) and calibration date(s) as applicable.
 8. Test results
 9. Analysis and recommendations
 10. Appendix, including appropriate test forms
- B. Furnish completed reports to the Engineer no later than twenty (20) days after completion of the tests.
- C. These are in addition to requirements on Paragraph 3.05.

PART 3 - EXECUTION

3.01 TESTING

- A. General requirements: Test all wire, cable, and electrical equipment installed and connected by the Contractor to assure proper installation, setting, connection, and function as indicated or to conform to Contract Documents and manufacturer's instructions. As an exception to requirements stated elsewhere in the Contract, give the Engineer at least 7 calendar days-notice of the dates and times scheduled for tests

(except megger tests) so Engineer may witness the tests. After the installation has been completed, the Contractor shall conduct an operating test demonstrating all equipment and devices operate in accordance with the requirements of the plans and specifications.

1. Be responsible for all damage to equipment or material due to improper test procedures or test apparatus handling.
 2. Perform tests recommended by the equipment manufacturer.
 3. Perform additional tests, which are required due to field conditions.
 4. Plan all testing and device adjustments with sufficient time available to complete all work in advance of the start of commissioning for the equipment. Phase Work and complete the testing and adjustments as equipment is installed. Seal or lock all equipment to prevent tampering or altering of set points following adjustment.
- B. Submit completed test results for review by the Engineer prior to energizing any equipment or component from the permanent power system. Obtain the Engineer's permission prior to energizing any equipment or component from the permanent power system.
- C. Provide all temporary hardware, devices and wiring necessary to perform Acceptance Testing and Functional Testing.
- D. All inspections shall be performed in accordance with applicable codes and standards.
- E. The independent Testing Agency shall provide all materials, equipment, labor and technical supervision to perform the inspections and tests.
- F. Perform Acceptance Testing and Functional Testing on each component of the systems identified in this Specification Section.

3.02 INSPECTION, TESTING, CALIBRATION AND ADJUSTMENT

- A. A visual inspection of the installed equipment shall be performed by the Independent Testing Agency to verify that the distribution equipment installed and to be tested is the equipment on the reviewed shop drawings. An inspection shall verify the equipment nameplate designations, characteristics, device ratings and ratios, project installation requirements, manufacturer's installation requirements, and applicable code and standards requirements. Initial preparation and tests shall include but not be limited to the following:
1. Inspect for physical damage.
 2. Clean equipment and apparatus.
 3. Insulation-resistant and continuity test.
 4. Verify proper equipment connection.
 5. Verify conductor connection torque values.
 6. Verify medium voltage substations and walk-in enclosures' bus splice plate and junction connection torque values.
- B. After completion of the visual inspection, a report shall be developed stating any discrepancies that may have been found. The Contractor shall correct all discrepancies prior to testing.

- C. The Contractor shall provide suitable and stable source of electrical power to each test site as required by the Testing Agency.
- D. Set protective devices and relays according to settings prepared per Section 26 05 73 – Overcurrent Protective Device Coordination Study.

3.03 SYSTEM FUNCTIONAL ACCEPTANCE TESTING

- A. System functional acceptance tests are to prove the performance, control and protection required by the contract is achieved. Testing shall demonstrate all devices are properly programmed, configured and integrated to achieve the required results.
- B. It is the intent of system functional tests to prove the proper interaction of all sensing, processing, and action devices to affect the designed result. System functional tests shall be completed prior to any system commissioning activity.
- C. Equipment manufacturer shall provide field technical personnel for field testing of programming and start-up of the power metering and data network systems.
- D. The functionality of all systems identified in this Section and corresponding sub-systems shall be tested and test reports shall be prepared and submitted.

3.04 MEDIUM VOLTAGE CABLES

- A. The cable installer shall perform cable and connector testing. Submit personnel testing qualifications of competency and experience for components to be tested thirty (30) days before Work is performed. Contractor testing personnel shall have competent certification training in the past 12 months on cable testing equipment required by this Section.

3.05 IDENTIFICATION

- A. Upon completion of the tests and inspections noted in these specifications, attach a label to all serviced devices indicating the date serviced and the testing company responsible.

3.06 TESTING PROCEDURE:

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

3.07 TEST RESULTS REPORTS:

- A. Acceptance testing shall not be complete until all test report results are within the manufacturer's recommended tolerances and normal NETA ATS test tolerances where applicable. The Contractor shall make all necessary corrections to the satisfaction of the Engineer.

3.08 TRANSMITTAL OF REPORTS:

- A. Transmit test reports to the Engineer per Section 01 77 00 –Closeout Procedures.

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 01 26 – Acceptance Testing of Electrical Systems
 - 2. Section 26 05 13 - Medium Voltage Cables and Accessories
 - 3. Section 26 05 19 – Low Voltage Electrical Power Conductors and Cables
 - 4. Section 26 05 33 – Raceways and Boxes for Electrical Systems
 - 5. Section 26 05 48 – Seismic Controls for Electrical and Communications Work
 - 6. Section 26 05 53 – Identification for Electrical System
 - 7. Section 26 05 73 – Overcurrent Protective Device Coordination Study
 - 8. Section 26 09 99 – Commissioning of Electrical Systems
 - 9. Section 26 12 16 - Medium Voltage Power Substations
 - 10. Section 26 24 16 – Panelboards
 - 11. Section 26 27 26 – Wiring Devices
 - 12. Section 26 28 00 – MV Automatic Power Correction Capacitors
 - 13. Section 26 43 13 – Surge Protective Devices
 - 14. Section 26 90 11 – High Voltage Shore Power Receptacles
 - 15. Section 33 71 19 – Electrical Underground Ducts and Manholes
 - 16. Section 33 77 00 - Medium Voltage Shore Power Switches in Walk-In Enclosures
 - 17. Section 33 79 00 – Site Grounding

1.02 DEFINITIONS:

- A. NEC means National Electrical Code.
- B. The term "code" as used herein shall mean all applicable National, State and local codes.
- C. The term "provide" shall mean furnish, install, and connect equipment and materials complete in operating condition.
- D. The term "approved" as used herein shall mean the written approval of the Engineer.

1.03 WORK INCLUDED:

- A. The Electrical work consists of furnishing, installing, testing and placing in satisfactory operation all equipment, materials, devices and appurtenances, necessary to provide a complete electrical system according to the intent of the Drawings and Specifications. In general, this includes all labor, materials, equipment, tools, etc. to complete the electrical work.

- B. All metal fabrications are to be 316 stainless-steel for exterior installations, and painted steel for interior installations. The work shall consist of furnishing all materials, labor, and equipment for fabricating and/or repairing, PVC coating, painting, and erecting metal fabrications, all in accordance with the Drawings, notes, and this specification. Exposed galvanized steel is not allowed.
- C. General requirements for materials and installation methods.
- D. As part of this project, Contractor is required to perform civil work as related to Tacoma Power vaults, conduits and trench requirements as indicated on the drawings, all per Tacoma Power Standard Requirements. Prior to bid, Contractor shall become familiar with Tacoma Power Electrical Construction Standards. These can be reviewed at www.mytpu.org/contact/bids-contracts/prequalification-electrical-contractors.htm. This work will be inspected by a Tacoma Power Construction Inspector. This is a different electrical inspector and inspection from the NEC inspector and inspections required by the electrical permit. The portion of the electrical work associated with Tacoma Power's conduits and vaults must be done by an electrical sub-contractor listed on Tacoma Power's pre-qualified electrical contractors list. The list is available at:

<http://www.mytpu.org/contact/bids-contracts/prequalification-electrical-contractors.htm>

1.04 INTENT OF DRAWINGS:

- A. The Electrical Drawings are intended to serve as working Drawings for general layout. Equipment, concrete vaults, switches, panels, disconnects and raceway locations 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 concrete vaults, raceways, outlets and the like, from those shown on the Drawings, shall be made without extra charge if so directed before installation.
- C. Contractor is required to take all working dimensions from civil drawings and field measurements. Do not scale electrical Drawings.

1.05 MANUFACTURERS' RECOMMENDATIONS:

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

1.06 RELATED WORK:

A. TEMPORARY CONSTRUCTION POWER:

1. Arrange with the Port of Tacoma for a new 480V temporary electrical service at both Pier 3 and Pier 4 construction areas.
2. Contractor is responsible for all costs associated with setup and removal of the temporary service and construction utility meter to serve the Contractor construction trailers.
3. Portable power sources to construction sheds, outdoor construction machinery, and temporary exterior work areas shall be the responsibility of the Contractor.

4. Provide and maintain construction lighting with portable wiring and temporary energization of the permanent site wiring, complete with lamps. Suitable construction lighting shall be provided. See NEC ARTICLE 305 Temporary Wiring.
5. Provide adequate feeders, circuit breakers and duplex 15-ampere 120-volt receptacles. Provide 120 Volt construction receptacles with Ground Fault circuit protection in accordance with applicable WISHA safety standards.
6. Portable power cords from the outlets specified herein shall be the responsibility of the contractor using the cords.
7. The Contractor shall assume all responsibility for safety, Electrical and Safety Code compliance, performance and adequacy of the construction power and lighting installation. The Engineer 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 project.
8. Coordinate with Spec Section 01 50 00 – Temporary Facilities and Controls.

B. EQUIPMENT FURNISHED BY OTHERS:

1. All equipment furnished for this project shall be coordinated with the Drawings to ensure 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. Control Voltages shall not exceed 120 volts. Provide control transformers for higher line voltages. Control transformers shall be connected from phase to neutral.

1.07 SUPERVISION AND COORDINATION:

- A. Coordinate work with Tacoma Power to ensure compliance with their specific requirements. Before starting work, contact Tacoma Public Utilities, 253-502-8290, Joe Rempe and make arrangement for their services to this project.
- B. Contact Electrical Inspection, Tacoma Power (253-502-8541), obtain and pay for permit before starting work.
- C. Contractor shall have a responsible person in charge at the site any time work is in progress or when necessary for coordination with other trades.

1.08 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 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

WAC	Washington State Administrative Code
NESC	National Electrical Safety Code
NEMA	National Electric Manufacturers Association
NETA	National Electrical Testing Association
NFPA	National Fire Protection Association
UL	Underwriters Laboratories, Inc.
ICEA	Insulated Cable Engineers Association
CBM	Certified Ballast Manufacturers
IBC	International Building Code
ETL	Electrical Testing Laboratories
TPU	Tacoma Public Utility Standards and Requirements

- B. Nothing in these Drawings and Specifications shall be construed as permitting work not conforming with governing codes.
- C. 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.
- D. Contractor shall include in bid all costs to have a Department of Labor & Industries approved firm to evaluate the installation safety, and compliance with code as required per WAC 296-40-100 for any equipment specified or furnished that is not UL labeled.
- E. For equipment furnished by others not UL labeled the contractor shall not connect the equipment to the electrical system until receiving written approval by the electrical authority having jurisdiction.

1.09 PERMITS AND 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.

1.10 WORKMANSHIP:

- 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.

1.11 AS-BUILT RECORD DRAWINGS:

- A. See Specification Section 01 77 00 - CLOSEOUT PROCEDURES.

1.12 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.

1.13 ELECTRICAL EQUIPMENT O&M MANUALS:

-
- A. See Specification Sections 01 77 00 – Closeout Procedures, and Section 01 78 23 – Operation and Maintenance Manuals.

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 ensure satisfactory operation and manufacturer's rated life in the prevailing environmental conditions, where installed. Materials and equipment shall be listed by Underwriter's Laboratories or a Washington Administration Code (WAC) 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 using this information in no way implies having tested or otherwise verified the results of published manufacturer's information.

2.03 AS SPECIFIED EQUIPMENT:

- A. This specification generally lists multiple make and model numbers for each item of equipment or material required for the project. This is intended to indicate the standard of quality, design, and features required. See Section 00 26 00 – Substitution Procedures for specific requirements.
- B. 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."

2.04 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 additional materials required by the manufacturer, installation methods, codes and performing all labor required to provide a complete and operable system.

2.05 SUBMITTALS

- A. Submit for all materials specified. Comply with the Conditions of the Contract and Division 01 Sections.

PART 3 - EXECUTION

3.01 PROTECTION OF WORK:

- A. Protect all work, wire, 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.

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- B. 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. Pull a properly sized mandrel through each conduit prior to installation of wire or pull string for empty conduits and within 24 hours of CDF placement (duct tape not acceptable). 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.
 - E. Empty conduits and conduits with conductors shall be provided with 150-pound-test nylon cord with distance markings, and with labels at source and destination matching plans. Ends of empty conduits shall be filled with removable foam.

3.02 CUTTING AND PATCHING:

- A. Obtain permission from the Engineer prior to cutting. Locate cuttings so they will not weaken structural components. Cut carefully and only the minimum amount necessary. Cut concrete with diamond core drills or saws except where space limitations prevent the use of such equipment.
- B. All construction materials damaged or cut into during installation must be repaired or replaced with materials of like kind and quality as original materials by skilled labor experienced in that particular building trade.

3.03 PAINTING:

- A. Equipment scratched or marred in shipment or installation shall be refinished to the satisfaction of the Engineer.

3.04 LABELING:

- A. Refer to Specification 26 05 53 Identification for Electrical Systems.

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 01 26 – Acceptance Testing of Electrical Systems
2. Section 26 05 00 – Common Work Results for Electrical
3. Section 26 05 33 – Raceways and Boxes for Electrical Systems
4. Section 26 05 53 – Identification for Electrical System
5. Section 26 05 73 – Overcurrent Protective Device Coordination Study
6. Section 26 12 16 - Medium Voltage Power Substations
7. Section 26 28 00 – MV Automatic Power Factor Correction Capacitors
8. Section 26 90 11 – High Voltage Shore Power Receptacles
9. Section 33 71 19 – Electrical Underground Ducts and Manholes
10. Section 33 77 00 - Medium Voltage Shore Power Switches in Walk-In Enclosures
11. Section 33 79 00 – Site Grounding

1.02 WORK INCLUDED:

A. Provide 15KV medium voltage cable, splices, terminations and equipment.

1.03 QUALIFICATION AS ACCEPTABLE INSTALLER:

A. The subcontractor installing the materials specified in this section shall meet the following qualifications:

1. Organization has installed similar primary voltage (15kV) systems for five (5) years as a principal business, not just occasionally.
2. Organization has proper tools for medium voltage work.
3. Above information shall be submitted for Engineer's review and approval as part of the shop drawing review process.

1.04 SUBMITTALS

A. The following information shall be submitted in accordance with Section 01 33 00 – Submittal Procedures:

1. Product Data: For each type of product indicated.

B. Schedule of cable pulls showing calculated pulling tension and sidewall pressure values for all cables.

PART 2 - PRODUCTS

2.01 CONDUCTORS - 15KV POWER CABLE, COPPER, EPR, UL TYPE MV105:

-
- A. Quality Assurance
1. Single-Source Responsibility: All medium-voltage cable and accessories shall be the product of a single manufacturer.
 2. Manufacturer Qualifications: Firm with 10 years experience in manufacturing medium-voltage cable with triple extrusion of EPR insulation and accessories similar to those indicated for this Project, with a record of successful in-service performance and having ISO-9000 approval certification.
 3. Manufacturer Warranty: Provide 20-year design service life statement.
 4. Listing and Labeling: Provide medium-voltage cable and accessories 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.
 - a. Cable shall comply with UL Standard 1072.
 5. Comply with the following standards:
 - a. NFPA 70, as adopted and administered by the Authority Having Jurisdiction.
 - b. ANSI C2 “National Electrical Safety Code” for components and installation.
 - c. Insulated Cable Engineers Association (ICEA) for components and installation.
 - d. Association of Edison Illuminating Companies (AEIC) for components and installation.
 - e. ASTM for components and installation.
 - f. National Electrical Manufacturers Association (NEMA) for Components and Installation
 6. Identification: Cable shall be new and of recent manufacture (no more than 12 months old) and shall have label showing the name of cable manufacturer, size, plant location, insulation type, insulation thickness, voltage rating, insulation level, sequential footage, year of manufacture and UL designations.
 7. Installer Qualifications: Engage an experienced and certified cable splicer to install, splice, and terminate medium-voltage cable.
- B. SUBMITTALS
1. General: Comply with the Conditions of the Contract and Division 01 Sections.
 2. Product data for cables and cable accessories, including splices and terminations.
 3. Product certificate signed by product manufacturer stating the product(s) supplied comply with the specified requirements.

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4. Qualification data for firms and persons specified in “Quality Assurance” Article to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, names of Engineers and Owners, and other information specified.
 5. Product Test Reports: Certified reports of Manufacturers’ design and production tests indicating compliance of cable and accessories with referenced standards. Cables with the manufacturing date exceeding 12 months prior to the date of delivery to the Project site will not be accepted.
 6. Schedule of cable pulls showing calculated pulling tension and sidewall pressure values.
 7. Field test reports indicating and interpreting test results relative to compliance with performance requirements specified. Include certified copies of field test records.
 8. Maintenance data for cables and accessories to include in the “Operations and Maintenance Manual” specified in Division 01.
- C. DELIVERY, STORAGE, AND HANDLING
1. Deliver medium-voltage cable on factory reels conforming to NEMA WC 26.
 2. Store cables on reels on elevated platforms in a dry location.
- D. MANUFACTURERS
1. Acceptable Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Cables:
The Okonite Co.
Southwire
Pirelli
General Cable
Or Engineer Approved Equal
 - b. Cable Splicing and Terminating Products and Accessories:
Elastimold.
3M Company; Electrical Products Division.
Raychem Corp.; Energy Division.
Cooper Power Systems, Inc., RTE Components.
Thomas & Betts Corp.
Or Engineer Approved Equal

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- E. 15kV CABLES
1. Type: MV-105 (UL Standard 1072).
 2. Conductor: Copper single-conductor.
 3. Conductor Stranding: Compact Class B conductor stranding.
 4. Insulation: Ethylene-propylene rubber (EPR) conforming to AEIC CS6.
 5. Insulation: Shielded Power Cables 15 kV.
 - a. Voltage Rating: 15 kV.
 - b. Insulation Thickness: 133 percent insulation level with thickness per manufacturer's standard.
 6. Shielding: 5-mil uncoated copper tape with minimum 25% overlap.
 7. Jacket: Sunlight-resistant polyvinyl chloride (PVC).
- F. SPLICE KITS
1. Connectors: IEEE 404, compression type, as recommended by cable or splicing kit manufacturer for application.
 2. Splicing Products: As recommended in writing by the splicing kit manufacturer for the specific sizes, ratings, and configurations of cable conductors and splices specified. Include all components required for complete splice, with detailed instructions.
 - a. Taped splice kit.
 - b. Combination tape and cold-shrink rubber sleeve kit with re-jacketing by cast-epoxy-resin encasement or other waterproof, abrasion-resistant material.
 - c. Heat-shrink splicing kit of uniform cross-section polymeric construction with outer heat-shrink jacket.
 - d. Pre-molded, cold-shrink rubber, inline splicing kit.
 - e. Pre-molded ethylene propylene diene monomer (EPDM) splicing body kit with cable joint sealed by interference fit of mating parts and cable.
- G. SOLID TERMINATIONS
1. Conductor Terminations: Comply with IEEE Standard 48, as indicated. Insulation class equivalent to that of the cable. Terminations for shielded cables shall include a shield grounding strap.
 - a. Class 1 Termination for Shielded Cable: Modular type, furnished as a kit, with stress-relief tube, multiple molded silicone rubber insulator modules, shield ground strap, and compression-type connector.
 - b. Class 1 Termination for Shielded Cable: Heat-shrinkable type with heat-shrinkable inner stress control and outer non-tracking tubes,

multiple molded non-tracking skirt modules, and compression-type connector.

- c. Class 1 Termination for Indoor Shielded Cable: Kit with stress-relief tube, non-tracking insulator tube, shield ground strap, compression-type connector, and end seal.
- d. Class 2 Termination for Shielded Cable: Kit with stress-relief tube, non-tracking insulator tube, shield ground strap, and compression-type connector. Include silicone rubber tape, cold-shrink rubber sleeve, or heat-shrink plastic sleeve moisture seal for end of insulation whether or not supplied with kits.
- e. Class 3 Termination for Shielded Cable: Kit with stress cone and compression-type connector.

H. SEPARABLE INSULATED CONNECTORS

- 1. Separable Insulated Connectors: Modular system complying with IEEE 386. Disconnecting, single-pole, cable terminators and matching stationary, plug-in, dead-front terminals designed for cable voltage and for sealing against moisture.
 - a. Terminations at Distribution Points: Modular type, consisting of terminators installed on cables and modular, dead-front, terminal junctions for interconnecting cables.
 - b. Load-Break Cable Terminators: Elbow-type units with 200 ampere load make/break and continuous current rating. Coordinate with insulation diameter and conductor size and material of cable being terminated. Include capacitively coupled test point on terminator body.
 - c. Dead-Break Cable Terminators: Elbow-type unit with 600 ampere continuous current rating, designed for de-energized disconnecting and connecting. Coordinate with insulation diameter and conductor size and material of cable being terminated. Include capacitively coupled test point on terminator body.
 - d. Dead-Front Terminal Junctions: Modular bracket-mounted groups of dead-front stationary terminals that mate and match with above cable terminators. Two-, three-, or four-terminal units as indicated, with fully rated, insulated, watertight conductor connection between terminals. Grounding lug and manufacturer's standard accessory stands and stainless-steel mounting brackets and attaching hardware.
 - e. Protective Cap: Insulating, electrostatic-shielding, water-sealing cap with drain wire.

I. ARC-PROOFING MATERIALS

- 1. Tape for First Course on Metal Objects: 10-mil thick, corrosion-protective, moisture-resistant PVC pipe-wrapping tape.

2. Arc-Proofing Tape: NRTL-listed fireproofing tape, flexible, conformable, intumescent to 0.3 inch thick, and compatible with the cable jacket on which used. Scotch No. 77 or approved equal.
 3. Glass Cloth Tape: Pressure-sensitive adhesive type, 1/2 inch wide.
- J. SOURCE QUALITY CONTROL
1. Test and inspect cables according to NEMA WC 74 (ICEA S-93-639) before shipping.

PART 3 - EXECUTION

3.01 CABLES - GENERAL

- A. Examine and swab out raceways to receive medium-voltage cable for compliance with installation tolerances and other conditions affecting performance of the cable.
- B. Install medium-voltage cable according to manufacturer's written instructions and IEEE 576.
- C. Pull conductors simultaneously where more than one cable is indicated in same raceway.
 1. Use NRTL-listed and manufacturer-approved pulling compound or lubricant where necessary.
 2. Lubricants used to facilitate pulling of cables shall not be damaging to the cable jacket.
 3. Use pulling attachments that will not damage cables such as fish tape, cable, rope and basket-weave/cable grips.
 4. Use of trucks, forklift, or similar equipment are not acceptable for pulling of cable. Where cables are not hand pulled contractor shall use "hydraulic tigger" with tension gauge.
 5. Submit to the Engineer a schedule of cable pulls showing calculated pulling tension and sidewall pressure values. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Train cables around walls of cable vaults, handholes, pull boxes and junction boxes by the longest route from entry to exit and support cables at intervals adequate to prevent sag.
- E. Arrange cables in manholes/vaults to avoid interference with duct entrances.
- F. Ground shields and metal bodies of shielded cable at terminations, splices and separable connectors.
- G. Arc-proof medium-voltage cable with fire taping at locations not protected by conduit, cable tray, or termination materials.
- H. Install exposed cables parallel and perpendicular to sides of exposed structural members.
- I. Install 'BURIED CABLE' warning tape 12 inches below base course ACP.

3.02 CABLE TERMINATIONS AND SPLICES

- A. Install splices in manholes/vaults through which the cable passes using a standard kit. Conform to kit manufacturer's written instructions.
- B. Install terminations at ends of conductors. Conform to manufacturer's written instructions. Comply with classes of terminations indicated.
- C. Quantities: Provide the following quantities of components:
 - 1. Protective Cap: Install at each terminal junction, one on each terminal to which no feeder is indicated to be connected.
 - 2. Standoff Insulator: 3.
- D. Contractor to apply NO-OX-ID, or Engineer approved equal electrical contact grease at all terminations on the wharf.

3.03 ARC-PROOFING

- A. Arc-proof medium-voltage cable at locations not protected by conduit, or termination materials except where indicated. Apply as follows and as recommended by the manufacturer of the arc-proofing tape.
 - 1. Clean cable sheath.
 - 2. Wrap metallic cable components with 10-mil pipe wrapping tape.
 - 3. Smooth surface contours with electrical insulation putty.
 - 4. Apply arc-proofing tape in one half-lapped layer with the coated side toward the cable.
 - 5. Band the arc-proofing tape with 1-inch-wide bands of half-lapped adhesive glass-cloth tape 2 inches on center.

3.04 GROUNDING

- A. Ground shields of shielded cable at terminations, splices, and separable insulated connectors. Ground metal bodies of terminators, splices, cable and separable insulated connector fittings, and hardware according to Manufacturer's written instructions.

3.05 IDENTIFICATION

- A. Identify medium-voltage cables in accordance with Specification Section 26 05 53.
- B. Label cables, feeders, and power circuits in vaults, pull boxes, junction boxes, manholes, and at all terminations. Include operating voltage, circuit number and phase designation.

3.06 FIELD QUALITY CONTROL

- A. Testing: Upon installation of medium-voltage cable and before electrical circuitry has been energized, demonstrate product capability and compliance with requirements.

1. Procedures: Perform each visual and mechanical inspection and electrical test stated in NETA Standard ATS, Section 7.3.2. Certify compliance with test parameters.
 - a. Megger all cables before hypotential testing. Use the following megger voltages:

<u>Cable Rating</u>	<u>Megger Voltage</u>
15 kV	15 kV

Determine the insulation resistance values with cables disconnected at each end. Megger cable and hypotential test only after all splices and terminations are made.

- b. Field test all cables in accordance with:
 - 1) IEEE 400.
 - 2) ICEA No. T-27-581, "Standard Test Methods for extruded dielectric Power Cables"
 - 3) 15kV EPR 133 percent insulation level grounded shielded cable tests:

Cable Size (AWG or kcmil)1-750

Test Voltage (KV, dc) 40 (15KV Cable)

Duration Minutes.....15
 - 4) Do not test cable with an ac test set. Disconnect cables from all equipment during testing. Testing cable on reel will not be acceptable. Test cable after installation but before final connection of equipment. Individually test each conductor with all other conductors grounded. Ground all shields.
 - 5) Use standard NETA test forms and record results.
 - 6) Correct deficiencies and retest to demonstrate compliance.

3.07 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to Manufacturer and Installer, to prevent entrance of moisture into the cable and ensure medium-voltage cable is without damage or deterioration.

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 01 26 – Acceptance Testing of Electrical Systems
 2. Section 26 05 00 – Common Work Results for Electrical
 3. Section 26 05 33 – Raceways and Boxes for Electrical Systems
 4. Section 26 05 53 – Identification for Electrical System
 5. Section 26 05 73 – Overcurrent Protective Device Coordination Study
 6. Section 26 12 16 - Medium Voltage Power Substations
 7. Section 26 24 16 – Panelboards
 8. Section 26 27 26 – Wiring Devices
 9. Section 26 28 00 – MV Automatic Power Factor Correction Capacitors
 10. Section 26 43 13 – Surge Protective Devices
 11. Section 33 71 19 – Electrical Underground Ducts and Manholes
 12. Section 33 77 00 - Medium Voltage Shore Power Switches in Walk-In Enclosure
 13. Section 33 79 00 – Site Grounding

1.02 WORK INCLUDED:

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

1.03 SUBMITTALS

The following information shall be submitted in accordance with Section 01 33 00 – Submittal Procedures:

1. Product Data: For each type of product indicated.

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 Underwriters' Laboratory (U.L.) Label. Reels shall be provided with suitable protection to prevent fork-lift damage to conductors during shipment or storage prior to use.

2.02 CONDUCTORS - 600 VOLTS:

- A. Stranded Copper, insulated for 90 degrees and 600 volts.
- B. Insulation type XHHW-2 for exterior use and type THHN/THWN for indoor use. Insulation requirements may vary per the NEC where necessary to suit more stringent installation conditions.

2.03 CONNECTORS AND SPLICES - 600 VOLTS:**A. Branch circuit conductor splices:**

Pre-insulated "twist-on" type or "crimped-on" type as approved (Scotch-Lok, Ideal or Engineer Approved Equal).

B. Terminator lugs of No. 12 wire and smaller:

Spade, insulated type to be tool applied.

C. Terminator lugs for No. 10 wire or larger:

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

2.04 INSULATING MATERIALS:**A. Insulating tape or heat shrink tubing shall have the equivalent rating of the applicable conductor insulation (Scotch 3M, RAYCHEM or equal).****2.05 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 CONDUCTOR TYPES, REFERENCED ON PLANS:****A. Conductors shall be stranded copper.****3.03 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

B. 480/277 Volt system

A Phase - Brown

B Phase - Orange

C Phase - Yellow

Neutral -Gray

Grounding – Green with Yellow Trace

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.

3.04 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.
- 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. 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.
- E. Train wires around walls of cable vaults, handholes, pull boxes and junction boxes by the longest route from entry to exit and support cables at intervals adequate to prevent sag.
- F. Splices in raceways are not allowed. Splice only in vaults, handholes, or in equipment if approved per the NEC.

3.05 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.

3.06 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.
- C. All tool applied crimped connectors shall be applied per manufacturer's recommendations and physically checked for tightness.
- D. Contractor to apply NO-OX-ID, or Engineer Approved Equal electrical contact grease at all terminations on the wharf.

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 13 – Medium Voltage Cables and Accessories
 3. Section 26 05 19 – Low Voltage Electrical Power Conductors and Cables
 4. Section 26 05 53 – Identification for Electrical System
 5. Section 26 05 48 – Seismic Controls for Electrical and Communications Work
 6. Section 26 05 73 – Overcurrent Protective Device Coordination Study
 7. Section 26 12 16 - Medium Voltage Power Substations
 8. Section 26 24 16 – Panelboards
 9. Section 26 27 26 – Wiring Devices
 10. Section 26 28 00 – MV Automatic Power Factor Correction Capacitors
 11. Section 33 71 19 – Electrical Underground Ducts and Manholes
 12. Section 33 77 00 - Medium Voltage Shore Power Switches in Walk-In Enclosures
 13. Section 33 79 00 – Site Grounding

1.02 WORK INCLUDED:

- A. Provide all raceways for a complete electrical system. Include all fittings, hangers and appurtenances required for a complete installation.
- B. All steel slotted support systems for securing and supporting electrical equipment and devices are to be 316 stainless-steel for exterior installations, and galvanized steel for interior installations. Galvanized structural steel materials used for supporting electrical equipment shall be painted. The work shall consist of furnishing all materials and labor in accordance with the Drawings, notes, and this specification.

1.03 SUBMITTALS:

The following information shall be submitted in accordance with Section 01 33 00 – Submittal Procedures:

1. Product Data: For each type of product indicated.

1.04 REFERENCES:

- A. Polyvinyl Chloride (PVC) Coated Rigid Steel Conduit, thick wall (PVRSC): NEMA RN 1
- B. Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit: NEMA FB 1.
- C. Flexible Metal Conduit with polyvinyl chloride (PVC) jacket (LFMC): UL 360, and NFPA 70.
- D. Electrical Metallic Tubing (EMT): ANSI C80.3 and C80.4, and NFPA 70.

- E. Flexible Metal Conduit (FMC): UL 1, UL 1479, and NFPA 70
- F. Stainless Steel Enclosures: UL 508.

PART 2 - PRODUCTS

2.01 CONDUITS:

- A. Polyvinyl Chloride (PV) Coated Rigid Steel Conduit, Thick Wall (PVRSC).
- B. Sealtite Flexible Metal Conduit with polyvinyl chloride jacket (SFMC).
- C. Fiberglass Conduit
- D. Stainless Steel Enclosures.

2.02 FITTINGS:

- A. PVRSC fittings shall have threaded connections, and material to match conduit.
- B. PVC Coated Flexible Metal Conduit: Thomas & Betts "Super Liquid-Tight" with external ground lug or equal.
- C. SFMC: Fittings shall be compression type.
- D. Expansion Couplings: O.Z. type EX with ground jumper.
- E. Seismic deflection coupling: Appleton or equal.
- F. All conduit elbows 30 degrees or greater shall be factory made for galvanized rigid steel or PVRSC on wharf. All 90-degree elbows shall be a minimum radius of 24" or greater. Provide corrosion resistant tape (1/2 lap on all steel elbows below grade).

2.03 PULL AND JUNCTION BOXES:

- A. Enclosures: 316 Stainless steel NEMA 4X, with hinged door, suitable for outdoor locations.

2.04 EXPOSED RACEWAY IDENTIFICATION:

- A. Refer to Specification 26 05 53 Identification for Electrical System.

PART 3 - EXECUTION

3.01 GENERAL:

- A. All exposed raceway on the wharf shall be Fiberglass Conduit.
- 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 unacceptable.
- D. Use factory elbows for all conduits.
- E. The conduit layout shall be carefully planned by the contractor to ensure neat and workmanlike installation.
- F. 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 Port of Tacoma.

3.02 CONDUIT SIZING:

- A. Conduits shall be sized per code for conductors with type XHHW-2 insulation for exterior installations, and type THHN/THWN for interior installations, although thinner insulation types are permitted in some cases. Conduit size shall not be reduced if large size is specified on the drawing. Minimum conduit size shall be 3/4" trade diameter for above grade exterior installations, and 1/2" trade diameter for interior installations.

3.03 PVRSC:

- A. Install Fiberglass Conduit for all conduits where conduit is exposed on the wharf, in bullrail vaults, or above grade where subject to damage.

3.04 FLEXIBLE CONDUIT:

- A. Provide liquid tight flexible metal conduit connection to outdoor equipment. Conduit shall be installed without sharp bends and in minimum lengths required for the application but not longer than 6'-0".
- B. Flexible metal conduit shall not be used.

3.05 CONTINUITY OF CONDUIT SYSTEM:

- A. Conduits shall be assembled continuous and secured to boxes, panels, etc., with appropriate fittings to maintain electric continuity.

3.06 PULL-LINES:

- A. Provide 150-pound plastic pull-lines, with numbered distance marks at one-foot increments in all empty conduits and conduits with conductors to facilitate future conductor installation. Provide labels on source and end point of all pull lines

3.07 CONCRETE CAPS:

- A. All conduits installed for 13.8KV and shore power systems shall be encased in controlled density fill (CDF) the length of conduit trench: The CDF shall have a red dye added to the mix (five-pound bag per yard) by the concrete manufacturer. Adding dye or other coloring after pour is not acceptable.

3.09 ELECTRICAL TRENCHES

- A. All electrical trenching shall comply with Division 31 and Specifications 31 00 00 Earthwork.

END OF SECTION

PART 1 - GENERAL**1.01 WORK INCLUDED**

- 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 12 16 - Medium Voltage Power Substations
 2. Section 26 24 16 – Panelboards
 3. Section 26 28 00 – MV Automatic Power Factor Correction Capacitors
 4. Section 26 12 16 – Medium Voltage Power Substations
 5. Section 26 90 11 – High Voltage Shore Power Receptacles
 6. Section 33 77 00 - Medium Voltage Shore Power Switches in Walk-In Enclosures

1.02 WORK INCLUDED

- A. The extent and location of “Seismic Controls for Electrical and Communication Work” is shown in the Contract Documents. This section includes seismic restraints and other earthquake-damage-reduction measures for electrical equipment only. All structural components shown under the wharf on the drawings have been designed by structural engineer.

B. Definitions

1. 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.

1.03 GOVERNING CODES, STANDARDS, AND REFERENCES

- A. ACI 318 (American Concrete Institute) - Building Code Requirements for Structural Concrete.
- B. ASCE 7 (American Society for Testing of Civil Engineers) - Minimum Design Loads for Buildings and Other Structures.
- C. ASTM - American Society for Testing and Materials.
- D. ICBO - International Conference of Building Officials.
- E. IBC - International Building Code as adopted by the City of Tacoma.
- F. NFPA 70 (National Fire Protection Association) - National Electrical Code.

1.04 SUBMITTALS

- A. General: Submit per Spec Section 01 33 00 – Submittal Procedures.

1.05 QUALITY ASSURANCE

- A. Comply with ASCE 7 Chapter 13, Seismic Design Requirements for Nonstructural Components, unless requirements in this section are more stringent.
- B. Professional Engineer Qualifications:

1. All required calculations shall be provided by a Professional Engineer who is licensed in the State of Washington and who is experienced in providing seismic engineering services.
2. Certification by a Professional Engineer licensed in a state other than Washington, if requested, may be approved by the Engineer.

1.06 PROJECT CONDITIONS

A. In accordance with Section 1613, "Earthquake Loads" of the International Building Code:

1. See Sheet S1.1 for design values to be used.
2. The Component Importance Factor, I_p , shall be selected for each restraint assembly based on the system's purpose in accordance with Seismic Design Requirements for Nonstructural Components in ASCE 7.
3. Load combinations for design shall be in accordance with the IBC.
4. Any alternative designs to be considered for substitution shall be per the IBC and ASCE 7 provisions and will be subject to the approval of the Engineer.

1.07 COORDINATION

A. Coordinate layout and installation of seismic bracing structural system and electrical and other features in the vicinity.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Bracing and attachment: Subject to compliance with requirements, provide bracing and attachment products by one of the following, or other manufacturer with at least 5 years of experience in seismic-specific bracing systems:

1. Cooper B-Line; Division of Eaton
2. Erico
3. GS Metals; Division of Cooper
4. Hilti
5. Thomas & Betts; Division of ABB
6. Unistrut
7. Or Engineer Approved Equal.

B. Anchorage: Subject to compliance with requirements, provide anchorage products by one of the following, or other manufacturer with at least 5 years of experience in seismic-specific anchorage:

1. Hilti
2. Powers Fasteners
3. Red Head
4. Simpson Strong-Tie
5. Or Engineer Approved Equal.

2.02 MATERIALS

A. Use the following materials for restraints:

1. Indoor Dry Locations: Steel, zinc plated.
2. Outdoors and Damp Locations: Galvanized steel, painted.
3. Corrosive Locations: 316 Stainless steel.

B. Unless otherwise noted, steel materials shall be per Section 05 50 00 – Metal Fabrications.

2.03 ANCHORAGE AND STRUCTURAL ATTACHMENT COMPONENTS

A. Strength:

1. Strengths used for anchor design shall be as noted in the ICC-ES reports, including use of anchor design criteria specified in ACI 318.
 - a. Unless otherwise specifically approved by the Engineer, all anchors located in concrete shall be ICC-approved for and designed using “cracked concrete” criteria.
2. For each seismic restraint assembly, either Allowable Strength or Ultimate Strength design shall be used. Methodologies shall not be mixed within a single assembly.

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 A325.

E. Welding Lugs: Comply with MSS SP-69, Type 57.

2.04 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 A1011, Grade 33.
2. Materials for Fittings and Accessories: ASTM A575, ASTM A576, or ASTM A36.
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.
5. Channel-Type Bracing Assemblies: Slotted steel channel, with adjustable hinged steel brackets and bolts.

B. Hanger Rod Stiffeners: Slotted steel channels with internally bolted connections to hanger rod.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install seismic restraints according to applicable codes and regulations and as approved by authority having jurisdiction, unless more stringent requirements are indicated by manufacturer's recommendation or this section.

3.02 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. Holes for Expansion Anchors in Concrete: Drill at locations and to depths that avoid reinforcing bars and comply with anchor manufacturer's recommendations.

3.03 ELECTRICAL AND COMMUNICATION 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, or the minimum required by the anchor manufacturer, whichever is larger. Bases shall be 4" nominal thickness of concrete with #4 reinforcing bars each way on 12" centers. Trowel finish with 1" bevel edge all around.
- C. Torque bolts and nuts on studs to values recommended by equipment manufacturer.

3.04 SEISMIC BRACING INSTALLATION

- A. Expansion and Contraction: Install all electrical system components to allow for thermal movement of braced components.
- B. Attachment to Structure:
 - 1. All attachment to the structure shall be per the approved details.
 - 2. If specific attachment is not indicated for heavy electrical equipment, submit planned attachment detail to the Engineer for specific approval.

3.05 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

- A. Make flexible connections in raceways and cables 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.
 - 1. Where expansion or control joints are crossed, the flexible connection shall allow for movement in each direction (closing, opening, right, and left) equal to the joint's total width or greater, unless specified otherwise in the Contract Documents, specified otherwise on the structural drawings for the joint's construction, or approved by the Engineer.

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 13 – Medium Voltage Cables and Accessories
 - 3. Section 26 05 19 – Low Voltage Electrical Power Conductors and Cables
 - 4. Section 26 05 33 – Raceways and Boxes for Electrical Systems
 - 5. Section 26 12 16 - Medium Voltage Power Substations
 - 6. Section 26 24 16 – Panelboards
 - 7. Section 26 27 26 – Wiring Devices
 - 8. Section 26 28 00 – MV Automatic Power Factor Correction Capacitors
 - 9. Section 33 71 19 – Electrical Underground Ducts and Manholes
 - 10. Section 33 77 00 - Medium Voltage Shore Power Switches in Walk-In Enclosures
 - 11. Section 33 79 00 – Site Grounding

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

The following information shall be submitted in accordance with Section 01 33 00 – Submittal Procedures:

- 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 cover plate 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.
- 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 1/4" for nameplates on cabinet and equipment interiors, 3/8" height for sub letters on cabinet and equipment exteriors, and 1/2" 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 stop nut. 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 3/4-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 1/2", 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. 2 1/2 x 1 3/4" 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 1/2" diameter or 1 1/2" 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.
- 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
 - 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.

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 13 – Medium Voltage Cables and Accessories
 3. Section 26 05 19 – Low Voltage Electrical Power Conductors and Cables
 4. Section 26 12 16 - Medium Voltage Power Substations
 5. Section 26 24 16 – Panelboards
 6. Section 26 28 00 – MV Automatic Power Factor Correction Capacitors
 7. Section 33 77 00 - Medium Voltage Shore Power Switches in Walk-In Enclosures

1.02 SUMMARY

- A. The Contractor shall engage an electrical engineering firm to provide this overcurrent protective device coordination study. Contractor shall include all costs associated with this study, setting of all devices, and installing all arc flash labels to all electrical equipment in the bid proposal. This section includes computer-based, short circuit, overcurrent protective device coordination, and arc flash study for all devices of the electrical systems at Pier 3 and Pier 4. Protective devices shall be set by the Independent Testing Agency based on results of the protective device coordination study.
- B. This study also includes:
1. A short circuit, coordination, and arc flash hazard analysis.
 2. Providing self-adhesive arc flash hazard labels.
- C. The electrical engineering firm shall provide an initial study and submit with the electrical gear submittals for review and approval.
- D. The electrical engineering firm shall provide a final study prior to substantial completion. The final study shall include all installed cable lengths and changes made during construction.
- E. The electrical engineering firm contact Tacoma Power for data associated with primary side short circuit availability and over current protection coordination.
- F. The electrical engineering firm shall prepare and provide a short circuit, coordination, and arc flash study, recommended protective device settings including ground fault with representative curves for engineer's review and approval.
- G. Provide a minimum of three (3) copies (owner/engineer/contractor) as part of the shop drawing review.
- H. As part of the final submittal (corrected shop drawing submittal). Provide seven (7) copies. These will be used for owner/engineer/ contractor/independent testing agency/ O&M Manuals.

1.03 SUBMITTALS

The following information shall be submitted in accordance with Section 01 33 00 – Submittal Procedures:

- A. Product data: Submit computer software program to be used for studies.
- B. Product Certificates: Submit coordination-study and fault-current-study computer software programs to certify compliance with IEEE 399.
- C. Other Action Submittals: The following submittals shall be made after the approval process of system protective devices has been completed.
 - 1. Coordination-study power system input data, protective device settings including completed computer program input data sheets.
 - 2. Study and Equipment Evaluation Reports.
 - 3. Short Circuit (Fault) Study Report.
 - 4. Coordination Study Report.
 - 5. Arc Flash Study Report.
 - 6. Submit protective equipment shop drawings simultaneously with the protective device study.
 - 7. Certification: Two weeks prior to final inspection, deliver to the Engineer four copies of the following certifications:
 - a. Certification by the contractor that the protective devices have been adjusted and set in accordance with the approved protective device coordination study.
 - 8. The Contractor will be fully responsible for all changes required to remove and replace portions of the distribution system required by the study if the study is not performed PRIOR to ordering the gear.

1.04 QUALITY ASSURANCE

- A. Studies shall use computer programs 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 Specialist Qualifications: an entity experienced in the application of computer software used for these types of studies, having performed successful studies of similar magnitude on electrical distribution systems using similar devices. The electrical engineering firm shall be responsible for the study. All elements of the study shall be performed under the direct supervision and control of a licensed Engineer in the State of Washington.
- C. Comply with IEEE 242 for short-circuit currents and coordination time intervals.
- D. Comply with IEEE 399 for general study procedures.

PART 2 - PRODUCTS

2.01 COMPUTER SOFTWARE DEVELOPERS

A. Available Computer Software Developers: Subject to compliance with requirement. Companies offering computer software programs that may be used in the Work include, but are not limited to, the following:

1. SKM System Analysis
2. CGI CYME
3. EDSA Micro Corporation
4. ESA Inc.
5. Or Engineer Approved Equal

2.02 COMPUTER SOFTWARE PROGRAM REQUIREMENTS

- A. Comply with IEEE 399.
- B. Analytical features of fault-current-study computer software program shall include “mandatory”, “very desirable”, and “desirable” features as listed in IEEE399
- C. 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 rating of all overcurrent protective devices and shall demonstrate selective coordination by computer-generated, time-current coordination plots.

PART 3 - EXECUTION

3.01 GENERAL

- A. Examine project overcurrent protective device submittals for compliance with electrical distribution system coordination requirements and other conditions affecting performance.

3.02 POWER SYSTEM DATA

- A. Gather and tabulate the following input data to support coordination study:
1. Product data for overcurrent protective devices specified in other Division 26 and 33 sections and involved in overcurrent protective device coordination studies. Use equipment designation tags consistent with electrical distribution system one-line diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.
 2. Impedance of utility service entrance.
 - a. Electrical Distribution System Diagram: In hard-copy and electronic-copy formats, showing the following
 - a. Circuit breaker and fuse-current ratings and types.
 - b. Relays and associated power and current transformer ratings and ratios.
 - c. Transformer kVA, primary and secondary voltages, connection type, impedance, and X/R ratios.
 - d. Cables: indicate conduit material, sizes of conductors, conductor material,

insulation, and length.

e. Busway ampacity and impedance.

3. Data sheets to supplement electrical distribution system one-line diagram, cross-referenced with tag numbers on diagram, showing the following:
 - a. Special load considerations, including stating inrush currents and frequent starting and stopping.
 - b. Transformer characteristics, including primary protective device, magnetic inrush current, and overload capacity.
 - c. Ratings, types, and settings of utility company's Overcurrent protective devices.
 - d. Special overcurrent protective device settings or types stipulated by utility company.
 - e. Time-current-characteristic curves of device indicated to be coordinated.
 - f. Manufacturer, frame size, interrupting rating in amperes rms symmetrical, ampere or current sensor rating, long time adjustment range, short-time adjustment range, and instantaneous attachment adjustment range and current transformer ratio for overcurrent relays.
 - g. Manufacturer and type, ampere-tap adjustment range, time-delay adjustment range, instantaneous attachment range, and current transformer ratio for overcurrent relays.
 - h. Panelboards, switchgear ampacity, and interrupting rating in amperes rms symmetrical.

3.03 FAULT CURRENT STUDY

- A. The electrical engineering firm shall 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. Medium Voltage Substations
 2. Medium Voltage Walk-In Enclosures
 3. Medium Voltage Power Factor Correction Capacitors
 4. Medium Voltage Shore Power Receptacles at the Bullrail
 5. Branch Circuit Panelboards in the Substations and Walk-In Enclosures
- B. The electrical engineering firm shall calculate momentary and interrupting duties on the basis of maximum available fault current. Show interrupting (five-cycle) and time-delayed currents (six cycles and above) on medium-voltage breakers as needed to set relays and assess the sensitivity of Overcurrent relays.
- C. Equipment Evaluation Report:
 1. Overcurrent Protective Devices: Ensure interrupting ratings are equal to or higher than calculated 1/2-cycle symmetrical fault current.

2. 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.

3.04 COORDINATION STUDY

- A. The electrical engineering firm shall perform a coordination study using approved computer software program. Prepare 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 maximum and minimum interrupting duty (five cycles to two seconds) short-circuit currents.
 3. Calculate the maximum and minimum ground-fault currents.
- B. 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.
 - c. Permissible transformer overloads according to IEE C57.96 if required by unusual loading.
 2. Device settings shall protect transformers according to IEEE C57.12.00 for fault currents.
- C. 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 equivalent 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.
- D. Coordination-study Report: The electrical engineering firm shall prepare a written report indicating the following results of the coordination study:
 1. Tabular Format of Settings Selected for Overcurrent Protective Devices:
 - a. Device tag
 - b. Relay-current transformer ratios;
 - c. Circuit-breaker sensor rating; long-time, short-time, and instantaneous settings.
 - d. Fuse-current rating and type

- e. Ground-fault relay-pickup and time-delay settings
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. 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.
- E. Completed data sheets for setting of Overcurrent Protective Devices.
- 3.05 ARC FLASH HAZARD ANALYSIS
- A. The electrical engineering firm shall calculate the arc flash hazard category, the incident energy level and the flash hazard boundary for all electrical equipment.
 - B. Provide to the Contractor self-adhesive arc flash labels complying with ANSI Standards Z535.4-1998 for all electrical equipment identified in the arc flash study.
 - C. The Contractor shall install all arc flash labels to all electrical equipment of this project.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Commissioning of electrical power and control systems to provide Shore-To-Ship power to berthed ships is required.
- B. The following systems will be commissioned for both Pier 3 and Pier 4:
 - 1. Medium Voltage substations
 - 2. Medium Voltage Walk-In-Enclosure breakers, switches, and controls
 - 3. MV Automatic Power Factor Correction Capacitors
 - 4. Shore-To-Ship High Voltage Shore Power Receptacles

1.02 SCOPE OF WORK

- A. Commissioning of Shore-To-Ship power delivery systems shall include the Work necessary to supply the designated ship with shore power so that ship power generators can be shut down.
 - 1. Vessel commissioning described herein, only requires connection to one receptacle assembly per berth or substation (one bullrail vault at Pier 3 and one bullrail vault at Pier 4).
 - 2. Commissioning cannot be performed until all Functional Acceptance Testing described in Section 26 01 26 is complete and approved, including Functional Acceptance Testing of all three (3) shore power receptacles assemblies per each berth using load banks.
- B. Furnish all labor, materials, equipment, testing equipment and incidentals necessary to provide the required commissioning scope of work.
- C. Shore-To-Ship electrical power service shall be provided to designated ships. Contractor shall plan ahead to efficiently use available time and assume that vessel will be available for commissioning connection for only eight (8) hours maximum per berth.

1.03 RELATED REQUIREMENTS

- A. Section 26 01 26 – “Acceptance Testing of Electrical Systems”

1.04 REFERENCES

- A. State of Washington Administrative Codes (WAC)
- B. National Fire Protection Association (NFPA)
- C. National Electrical Code (NEC)
- D. IEC/ISO/IEEE 80005-1 2019 Ed. 1: Cold Ironing Part 1: High Voltage Shore Connection (HVSC) Systems - General Requirements.

1.05 SUBMITTALS

The following information shall be submitted in accordance with Section 01 33 00 – Submittal Procedures:

-
- A. Except as specifically noted, permitted or otherwise directed in this Section, submit all items in this section under a single common submission. Partial submittals are unacceptable and will be returned and noted "Revise and Resubmit".
 - B. Submit a Work Plan for Commissioning for Engineer review and approval a minimum of thirty (30) calendar days prior to commencing Commissioning Work. Update the Work Plan to reflect all changes required by Engineer.
 1. Include in the Work Plan a listing of all equipment, cable, and systems required for the Work, the tests to be performed, the method of testing to be used, sequence of work, procedures, and test forms. Test forms shall identify each test step and required results to accomplish the requirements of Articles 3.03, and 3.04 of this Section.
 2. Submit qualifications of Testing Agency and technicians to be assigned to the project for all equipment and systems commissioning. Include technicians that are familiar with the components of the power delivery system. Independent Testing Agency and technicians shall meet the requirements described in Section 26 01 26 – Acceptance Testing of Electrical Systems.
 - C. Submit test reports
 1. Prepare and submit test reports when individual tests are completed.
 2. Submit a preliminary copy of the test results to the Engineer no more than one week after a test is completed.
 3. All documentation of tests and inspections shall include:
 - a. Tester's name
 - b. Date
 - c. Items needed
 - d. Test results
 - e. Acceptance criteria
 - f. Corrective work
 4. Submit the final report no later than thirty (30) calendar days after completion of Commissioning. The final report shall include the following information: Summary of the project, description of the equipment tested, visual inspection report, description of the tests, test results, conclusions, recommendations and a statement that all corrections have been made. Provide an Appendix including test reports, and identification of the test equipment used. Secure final report and test documents together using index tabs, table of contents and a 3-ring binder. Provide one electronic copy in PDF format to go with two (2) hard copies bound in 3-ring binder.

1.06 RESPONSIBILITY

- A. The Contractor is responsible for any damage to equipment or material due to improper test procedures or test apparatus handling. Replace or restore to original condition any damaged equipment or material.

- B. The Contractor shall notify Engineer a minimum of thirty (30) calendar days prior to each Commissioning session to begin to coordinate scheduling with the Port and Tenant Vessel schedule.

1.07 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 01 26 - Acceptance Testing of Electrical Systems
 2. Section 26 05 13 – Medium Voltage Cable and Accessories
 3. Section 26 05 19 – Low Voltage Electrical Power Conductors and Cables
 4. Section 26 05 73 – Overcurrent Protective Device Coordination Study
 5. Section 26 12 16 - Medium Voltage Power Substations
 6. Section 26 24 16 – Panelboards
 7. Section 26 27 26 – Wiring Devices
 8. Section 26 90 11 – High Voltage Shore Power Receptacles
 9. Section 33 77 00 - Medium Voltage Shore Power Switches in Walk-In Enclosure
 10. Section 33 79 00 – Site Grounding

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

- A. Plan all Commissioning with sufficient time available to complete Testing and Commissioning according to a mutually agreed upon schedule.
- B. Provide all temporary hardware, devices, and wiring necessary to perform the Work.
- C. Submit comprehensive work plan according to Part 1 of this Section.
- D. Contractor shall arrange a Commissioning Meeting with Engineer, Testing Agency, switchgear manufacturer's factory representative, and Tenant to review comprehensive test plan a minimum of fourteen (14) calendar days prior to Commissioning activities.
- E. All testing shall be performed in accordance with applicable codes and standards including WEC, ANSI, IEEE, NEMA, NEC, and OSHA.

3.02 COMMISSIONING

- A. Commissioning shall be completed as soon as possible, after Electrical Acceptance Testing and Functional Testing have been completed. The Engineer and Terminal Operator will determine when Commissioning can be performed. The Contractor shall schedule required personnel and equipment for each Commissioning session.

- B. The Contractor shall allow for a total of one (1) Commissioning session for Pier 3, and one (1) Commissioning session for Pier 4. Contractor shall assume that each session may occur on night and weekend hours depending on ship availability. The sessions are non-continuous and there may be days or weeks between session activities depending on commissioning success, shipping schedules, and Terminal Operator requirements.
- C. The Contractor shall arrange for all necessary personnel to be present at all times during each Commissioning session. As a minimum, the Contractor's superintendent, an electrical foreman, an electrician/technician, and a switchgear manufacturer's factory representative shall be present. The Independent Testing Agency that performed substation Acceptance Testing shall also be included in the support team for each session.
- D. Contractor shall interface with ship personnel during commissioning for Ship-to-Shore receptacles assembly cable connection work and trips on board ships to view synchronization, permissive, breakers, etc.
- E. Contractor shall ensure that required troubleshooting equipment is on hand during Commissioning.

3.03 TESTS TO BE PERFORMED PRIOR TO COMMISSIONING

- A. Commissioning tests are to be performed before vessel connections to Ship-to-Shore receptacles. The tests shall be performed with Shore Power Walk-In Enclosure 6.6kV Main Circuit Breaker in the Test position.
- B. Pre-Commissioning testing shall verify the correct operation of all shore-to-ship power connections and operations.
 - 1. Verify the following "No Ship At Berth" conditions:
 - a. Main Circuit Breaker: OPEN AND RACKED IN
 - b. All Ship-to-Shore receptacles load interrupter power disconnect switches: OPEN
 - c. All protective relays: RESET
 - d. All Ship-to-Shore receptacles enclosures: CLOSED
 - e. All Ship-to-Shore receptacles: EMPTY
 - 2. Verify the following "Ship At Berth" conditions and use dummy cable plugs to perform power up sequence without closing the Main Circuit Breaker:
 - a. Verify safe ship plug condition.
 - b. Enter Ship-to Shore bullrail vault and insert dummy plugs into Ship-to-Shore receptacles assemblies and take key interlocks A/x, B/x.
 - c. Exit Ship-to-Shore receptacles assemblies vault, close lid and proceed to Remote Field Control Panel at walk-in-enclosure.
 - d. Confirm indicators at Remote Field Control Panel show selected Ship-to-Shore receptacles assemblies grounding switch "CLOSED" (red), power switch "OPEN" (green) and Main Circuit Breaker "OPEN" (green).

- e. Initiate associated Ship-to-Shore receptacles grounding switch "OPEN" and associated Ship-to-Shore receptacles power switch "CLOSE" at Field Control Panel by Inserting key interlocks A/x, B/x in receptacle switch and wait for confirming red indicator, that the switch is closed.
3. Using dummy plugs, cable continuity test switches shall be operated to verify 6.6kV Main Circuit Breaker trip signal.
4. The Walk-In Enclosure emergency stop circuit shall be tested. Verify the switchgear and Field Control Panel E-Stop switches produce trip signals for the 6.6kV Main Circuit Breaker. Contractor shall reset switchgear after each trip operation and advance the sequence.
5. After tests are satisfactorily completed, return status of all items to the "No Ship At Berth" status. Restore 6.6kV Main Circuit Breaker to normal racked in position.

3.04 TESTS TO BE PERFORMED FOR COMMISSIONING

- A. Work sequence progress and scheduling shall be coordinated with the Engineer and Port, who will coordinate with Tenant Vessel schedule and facilitate coordination with the vessel's crew. Coordinate each step with the Tenant and Vessel crew as directed by the Port. Vessel's power cables will be handled and connected to Ship-to-Shore receptacles by others.
- B. Commissioning tests are to be performed with ship power cables connected at the Ship-to-Shore receptacles assemblies. The tests shall be performed with the Walk-In Enclosure Shore Power 6.6kV Main Circuit Breaker in the racked in position.
- C. The control procedures and measures of individual vessels may vary slightly. Contractor shall accommodate and make adjustments to support successful power delivery to the ships.
- D. Commissioning shall verify the correct operation of all shore-to-ship power connections in accordance with the below Sequence of Operations, operations and delivery of power to the ship. The ship's generators will be shut down for a period of time with all required ship power supplied by the shore-to-ship substation.
 1. Verify the following "No Ship At Berth" conditions:
 - a. Main Circuit Breaker: OPEN AND RACKED IN
 - b. All Ship-to-Shore receptacles assemblies load interrupter power disconnect switches: OPEN
 - c. All protective relays: RESET
 - d. All Ship-to-Shore receptacles assemblies enclosures: CLOSED
 - e. All Ship-to-Shore receptacles: EMPTY
 2. Ship cables handling, Ship-to-Shore receptacles vault opening and Ship-to-Shore receptacles plug connection shall be performed by others. The ship cable plugs shall be connected to shore power outlets and tested for correct operation.
 3. Verify "Ship At Berth" conditions identified in the following Sequence of Operations and perform power up sequence that will include closing the Main

- Circuit Breaker when Tenant directs.
- a. Verify safe ship plug condition.
 - b. Enter Ship-to-Shore receptacles vault and insert ship plugs into Ship-to-Shore receptacles and take key interlocks A/x, B/x.
 - c. Exit Ship-to-Shore receptacles vault, close lid and proceed to Walk-in-Enclosure Remote Field Control Panel.
 - d. Confirm indicators at Remote Field Control Panel show selected Ship-to-Shore receptacles grounding switch "CLOSED" (red), power switch "OPEN" (green) and Main Circuit Breaker "OPEN" (green).
 - e. Initiate associated Ship-to-Shore receptacles grounding switch "OPEN" and associated SP power switch "CLOSE" at Field Control Panel and wait for confirming green indicator by Inserting key interlocks A/x, B/x in receptacle switch and wait for confirming red indicator, that the switch is closed.
 - f. Initiate 6.6kV Main Circuit Breaker "CLOSE" at Field Control Panel by inserting key interlock M/x and wait for confirming red indicator.
 - g. Advise ship personnel power 'ON' condition
4. Verify the switchgear and Field Control Panel E-Stop switches produce trip signals for the 6.6kV Main Circuit Breaker. The ship borne shore power E-stop circuit shall be tested. The activation of the emergency stop switch on the ship shall be performed by others. Contractor shall reset switchgear after each trip operation and advance the sequence.
 5. After "Ship At Berth" tests are satisfactorily completed, deliver power to ship for a minimum of fifteen minutes.
 6. When notified, perform the following "Ship Leaving Berth" sequence:
 - a. Advise ship personnel of pending power 'OFF' condition.
 - b. Proceed to Walk-in-Enclosure Remote Field Control Panel and confirm indicators show selected Ship-to-Shore receptacles grounding switch "OPEN" (green), power switch "CLOSED" (red) and 6.6kV Main Circuit Breaker "CLOSED" (red)
 - c. Initiate Main Circuit Breaker "OPEN" at Remote Field Control Panel by inserting key interlock M/x and wait for confirming green indicator.
 - d. Initiate associated Ship-to-Shore receptacles power switch "OPEN" and associated Ship-to-Shore receptacles grounding switch "CLOSE" at Remote Field Control Panel by inserting key interlock M/x and wait for confirming green indicator.
 - e. Proceed to associated Ship-to-Shore receptacles vault. Open lid, enter enclosure.
 - f. Insert key interlocks A/x, B/x to each receptacle and remove ship plugs, exit vault and close lid.
 - g. Advise ship personnel operation complete.

7. Return status of all items to the "No Ship At Berth" status.

3.05 TEST RESULT REPORTS

- A. Commissioning will not be complete until all test report results have been submitted, reviewed, and returned to the Contractor with a disposition of "No Exception Taken (NET)", "Make Corrections Noted (MCN)", or "Received for Information Only (FIO)". The Contractor shall make all necessary corrections to the satisfaction of the Engineer.

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 01 26 – Acceptance Testing of Electrical Systems
 2. Section 26 05 00 – Common Work Results for Electrical
 3. Section 26 05 13 – Medium Voltage Cables and Accessories
 4. Section 26 05 19 – Low Voltage Electrical Power Conductors and Cables
 5. Section 26 05 33 – Raceways and Boxes for Electrical Systems
 6. Section 26 05 53 – Identification for Electrical System
 7. Section 26 05 73 – Overcurrent Protective Device Coordination Study
 8. Section 26 24 16 – Panelboards
 9. Section 26 90 11 - High Voltage Shore Power Receptacles
 10. Section 33 71 19 – Electrical Underground Ducts and Manholes
 11. Section 33 77 00 - Medium Voltage Shore Power Switches in Walk-In Enclosures
 12. Section 33 79 00 – Site Grounding
 13. Section 03 30 00 – Cast-In-Place Concrete

1.01 SUMMARY

- A. This section includes requirements for design, fabrication, testing and delivery of the medium voltage metal-clad power substations with main 15kV service disconnect switch, primary 15kV circuit breaker, dry-type power transformer with neutral grounding resistor (NGR), secondary 15kV (6.6kV System) circuit breaker, control power transformer, panelboard, batteries, and SEL protection relays in a free standing NEMA 3R enclosure, as shown on the drawings and as specified herein. In addition, it shall include a Siemens WinPM power monitoring system on the primary and secondary transformer primary and secondary protection circuit breakers. The Siemens WinPM power monitoring system on the main circuit breaker shall include all components and wiring, or wireless equipment to be integrated with the existing Siemens WinPM system of the existing crane switchgear located next door of both Pier 3 and Pier 4 walk-in enclosures.
- B. Siemens WinPM power monitoring, control equipment, and cabling shall be factory installed as part of the transformer primary and secondary breakers of these medium voltage power substations.
- C. 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. IEC/IEEE 80005-1: 2019, IEC/ISO/IEEE 2019, Edition 2.0 2019-03 – Utility Connection in Port – Part 1 – High Voltage Shore Connection (HVSC) Systems – General Requirements.
- B. ANSI C57.12.28 - Switchgear and Transformers - Pad-Mounted Equipment - Enclosure Integrity.
- C. ANSI C57.12.55 - Conformance Standard for Dry-Type Transformers in Unit Installations.
- D. IEEE C57.12.91 - Test Code for Dry-Type Distribution and Power Transformers.
- E. IEEE C57.94 - Recommended Practice for Installation, Application, Operation, and Maintenance of Dry-Type General Purpose Distribution and Power Transformers.
- F. IEEE 386 - Separable Insulated Connector Systems for Power Distribution Systems Above 600 V.
- G. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment (International Electrical Testing Association).
- H. NFPA 70 (National Fire Protection Association) – National Electrical Code.

1.03 QUALITY ASSURANCE

- A. Listing and Labeling: Provide medium voltage power substations that are Listed and Labeled as defined in NFPA 70, Article 100, by a testing agency (UL) acceptable to the Authority Having Jurisdiction, and marked for intended use for the location and environment in which they are installed.
- B. Comply with IEEE C2.
- C. Comply with NFPA 70, as adopted and administered by the Authority Having Jurisdiction.
- D. Testing Agency Qualifications: Testing agency meeting OSHA criteria for accreditation of testing laboratories, Title 29, Part 1907 or a member company of the Inter-National Electrical Testing Association and that is acceptable to the Authority Having Jurisdiction.
 - 1. Testing Agency’s Field Supervisor: Person currently certified by the Inter-National Electrical Testing Association to supervise on-site testing specified in Division 26, “Acceptance Testing of Electrical Systems.”

1.04 SUBMITTALS

The following information shall be submitted in accordance with Section 01 33 00 – Submittal Procedures:

-
- A. Product Data: Include data on features, components, ratings, and performance for each type of electrical equipment specified for the medium voltage power substations.
1. Include dimensioned plans, sections, and front elevation views showing all electrical components.
 2. Transformer outline drawing with actual transformer dimensions and weight.
 3. Show minimum clearances and installed devices and features.
 4. Provide component list.
 5. Show conduit entry and exit locations.
 6. Install nameplate diagram per ANSI requirements.
 7. Provide transformer ratings, including percent impedance.
 8. Include location and size of IR windows for testing.
- B. Wiring Diagrams: Detail wiring and identify terminals for transformer tap changing and connecting field-installed wiring.
- C. Product Certificates: Signed by manufacturers of medium voltage power substations certifying that the products furnished comply with requirements.
- D. Factory Test Reports: Certified copies of manufacturer's design and routine factory tests required by referenced standards.
- E. Field Test Reports: Indicate and interpret test results for tests specified in Part 3.
- F. Maintenance Data: For all medium voltage power substations components to include in the maintenance manuals specified in Division 1.
- G. Drawings:
1. Prior to fabrication of the 15KV power substation, the following drawings shall be submitted by the manufacturer to the Engineer for approval, within thirty days of contract award:
 - a. Elevation views.
 - b. Base plan including mounting details, cable entry area, and door swing requirements.
 - c. Enclosure services electrical diagram.
 - d. Component bill of material indicating quantity, description, and part number.
 - e. Detailed electrical interconnection diagram for all equipment installed.

- f. Diagrams shall be based upon data sheets, interconnection documents, and system design requirements attached to this specification.
 - g. After the return of approval drawings or after any changes made to previously approved drawings, the manufacturer shall submit a record copy of any and all drawings that contained revisions.
 - h. After completion of the inspection and testing procedures, the manufacturer shall submit a complete set of “as built” drawings. These drawings shall function as a record of the final construction of the equipment at the time it left the factory.
- H. Final record drawings.
 - I. Operation and maintenance manuals.
 - J. Original certified test reports.
 - K. See Section 01 77 00 – Closeout Procedures

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Temporary Heating: For the dry-type transformers, apply temporary heat according to manufacturer’s written instructions within the enclosure of each ventilated-type unit throughout periods during which equipment is not energized and is not in a space that is continuously under normal control of temperature and humidity.
- B. All medium voltage power substations components shall be stored in a heated and ventilated shelter.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Eaton
 - 2. Schneider Electric (Square D)
 - 3. IEM
 - 4. ABB
 - 5. Siemens
 - 6. GE Electrical Distribution & Control
 - 7. Or Engineer Approved Equal

2.02 DRY-TYPE POWER TRANSFORMERS

- A. Windings: 2-winding type, designed for connection to a 3-phase, 3-wire 13.8 kV medium voltage primary system, and 3-phase, 3-wire 6.6kV connected secondary 3-wire, 60-Hz, grounded through a neutral grounding resistor (NGR).
- B. Winding Material: Copper.
- C. Busses and Terminals: Copper.
- D. Sound Level Standards: Sound level standards as defined in NEMA and ANSI
- E. In general, transformers shall be fed from a dedicated feeder. These power transformers shall be provided with suitable differential protection (ANSI device 87) scheme, whereby activation of the 87-type differential relay shall trip and lockout (86-T) the upstream draw-out circuit breaker, as shown on the drawings and specified herein.
- F. All transformers shall be furnished with two each full capacity taps above and below normal.

2.03 DRY-TYPE TRANSFORMERS SPECIFICATIONS

- A. Comply with ANSI C 57.12.50, IEEE C57.12.51, IEEE C.57.12.01, and IEEE C57.94, and list and label as complying with UL 1562.
- B. Ratings: Substation Transformer
 - 1. kVA Rating: As indicated on the drawings. Transformer shall have provisions for future fans to increase kVA rating, as shown on the drawings..
 - 2. Impedance: 5.75% +/- 0.75%.
 - 3. Nominal Primary Voltage: 13.8 kV Delta Connected.
 - 4. Nominal Secondary Voltage: 6.6 kV Wye Connected.
 - 5. HV BIL: 95 kV at 13.8 kV.
 - 6. LV BIL: 60 kV at 6.6 kV.
- D. Transformers shall be of solid epoxy-cast coils, dry-type construction, mounted in a suitable ventilated outdoor NEMA 3R enclosure.
- E. Terminations at the Substation transformer shall be side-wall mounted for close-coupling to a medium voltage (15kV) circuit breaker on the primary side and close-coupling to a medium voltage (15kV, 6.6kV System) circuit breaker on the secondary side.
- F. Both high and low voltage windings shall be of copper conductors. High and low voltage windings shall each be separately cast as one rigid tubular coil, and arranged coaxially. Each cast coil shall use a mineral-filled epoxy reinforced with fiberglass mat, and cast to provide complete, void-free resin impregnation

throughout the entire insulation system. The coil supports shall maintain constant pressure during thermal expansion and contraction of the coils. There shall be no rigid mechanical connection between high and low voltage coils.

- G. The windings must not absorb moisture and shall be suitable for both storage and operation in adverse environments, including prolonged storage in 100% humidity at temperatures -10 degrees C to +42 degrees C and shall be capable of immediately being switched on after such storage without pre-drying.
- H. The transformers' core shall be constructed of high grade, grain-oriented, silicon steel laminations, with high magnetic permeability. Magnetic flux density is to be kept well below the saturation point. The outside surfaces of the core shall be protected against corrosion by painting with a suitable coating after assembly. Core dipping is not acceptable.
- I. The enclosures shall be constructed of heavy-gauge sheet steel. All ventilation openings shall be in accordance with NEMA and NEC standards for ventilated enclosures. The cabinet shall have a minimum of four removable panels. Removable panels shall have handles.
- J. The bases shall be constructed to permit rolling or skidding in any direction, and shall be equipped with jacking pads designed to be flush with the transformer enclosure.
- K. The enclosures shall have (1) one additional coat of paint in addition to the standard number of coats.
- L. There shall be (1) one additional filter at all filter locations in addition to the standard number of filters.
- M. Full-Capacity Voltage Taps: Four 2-1/2% taps; 2 above and 2 below rated full voltage.
- N. Enclosure: Outdoor, ventilated, raintight, NEMA 250, Type 3R.
- O. Insulation Class: 220°C insulation system.
- P. Insulation Temperature Rise: 115°C maximum rise above 40°C.
- Q. Include the following Accessories:
 - 1. External Medium-Voltage Surge Arresters on primary and secondary side of transformers: Distribution class, low flashover, metal oxide varistor type complying with NEMA LA 1; factory installed and connected to both primary and secondary terminals.
 - 3. Primary Medium-Voltage Terminal Compartment: Full-height steel compartment to match transformers.
 - 4. Secondary Medium-Voltage Terminal Compartment: Full-height steel compartment to match transformers.
 - 5. High-Temperature Alarm: A sensor at the transformer with local audible and visual alarm and contacts for remote alarm.

2.04 15KV TRANSFORMER PRIMARY AND SECONDARY SWITCHGEAR DETAILS:

- A. The power substation switchgear line-up shall consist of two assemblies, the first assembly shall include the main service disconnect switch, and the transformer primary vacuum circuit breaker, both located on the transformer primary side, and the second shall include the transformer secondary vacuum circuit breaker, and as indicated on the drawings. The line-up will include the following:
1. One 1,200 Amp frame, 15KV metal/clad, power service disconnect switch, rating as indicated on the drawings.
 2. One 1,200 Amp frame, 15KV metal/clad, transformer primary vacuum circuit breaker with potential transformers (PT's) and current transformers (CT's) ratings as indicated on the drawings.
 3. External Medium-Voltage Surge Arresters on line side of the 15kV service disconnect switch: Distribution class, low flashover, metal oxide varistor type complying with NEMA LA 1; factory installed on the line side of the 15kV service disconnect switch.
 4. Power transformer (PT) to power the circuit breaker operators, heaters, and three (3) metering PT's to serve power monitors and trip relays.
 5. Circuit breaker control relays, types as indicated on the drawings.
 6. Ground-fault relays, Schweitzer Engineering Laboratories (SEL), or Engineer Approved Equal.

Provide raceway in switchgear line-ups for data wiring to metering cabinet located remote (within 100') from switchgear. Provide metering cabinet, equipment, metering software, and touch screen HMI.

2.05 15KV SWITCHGEAR RATINGS:

- A. The complete switchgear line-up shall comply with these electrical ratings:
- | | |
|---------------------------------|--|
| 1. Circuit Breaker Interrupting | 500MVA |
| 2. Design Voltage | 15KV |
| 3. System Voltage | 13.8KV |
| 4. BIL | 95KV |
| 5. Momentary Rating | 25kA RMS SYM. (40kA ASYM) |
| 6. Main Bus Rating | 1200A, 15KV |
| 7. Fault Closing | 25,000A RMS Symmetrical (40,000A Asymmetrical) |
| 8. Mechanical Endurance | 100,000 Operations |
- B. The potential transformers serving the walk-in enclosure controls and monitors shall be connected for proper installation, without a primary neutral connection.

2.06 15kV ENCLOSURE CONSTRUCTION:

- A. Each 15kV switch or vacuum draw-out circuit breaker bay shall be separately constructed to form a rigid free-standing unit. Adjacent bays shall be securely

bolted together to form an integrated rigid structure. Each individual bay shall be braced to prevent distortion under normal operating conditions as well as during the interruption of short circuit currents.

- B. Each cubicle shall have a flanged front door over the circuit breaker assembly and contain sufficient cabling space to permit cable installation without routing of line and load side connections in front of circuit breaker compartment.
- C. Each cubicle shall have IR windows installed, to enable use of infrared cameras without opening the switch cubicle.
- D. All enclosure openings shall be screened to prevent the entrance of small animals, and barriered to inhibit the entrance of dust, sand, etc.
- E. Each circuit breaker shall have a trip relay flush mounted on the enclosure door. All 15kV circuit breakers and service switch shall have a ground continuity monitor flush mounted on the enclosure door.
- F. The power substation switchgear line-ups shall be fully assembled and tested at the factory prior to shipment. Each section shall be provided with adequate lifting means and shall be capable of being rolled or lifted into installation position and bolted to a concrete slab or foundation.
- G. All 15kV wiring shall enter and exit through the bottom of cubicles.
- H. Provide grounding studs in all cubicles.
- I. Provide portable lift truck for removal and installation of vacuum circuit breakers.

2.07 BUS AND CONNECTIONS:

- A. All bus shall be copper. Bolted contact surfaces shall be plated with tin or silver. Insulators and compartment thru-wall bushings shall be glass polyester.
- B. The design of the bus, connections and supports shall be consistent with the mechanical stresses produced by a short circuit current equivalent to the interrupting current rating of the associated circuit breaker at service voltage. All hardware used on conductors shall have high tensile strength and anti-corrosive plating.
- C. A code size ground bus shall run continuously through each line-up and be securely connected to the steel frame of each bay. Provide lug provisions for code size ground conductor connections. Provide ground studs in all compartments.
- D. Provisions shall allow convenient extension of both the main bus and the ground bus to future adjacent bays.
- E. Acceptable Manufacturers:
 - 1. Eaton
 - 2. Schneider Electric (Square D)
 - 3. IEM
 - 4. ABB
 - 5. Siemens

6. General Electric
7. Or Engineer Approved Equal

2.08 METAL ENCLOSED VACUUM CIRCUIT BREAKERS:

- A. Vacuum Circuit Breakers shall be rated 15 KV, with ampere ratings as shown on the drawings, and 500 MVA short circuit rating.
- B. Vacuum Circuit Breakers shall each include a tripping power source without batteries.
- C. All vacuum circuit breakers shall be draw-out type.
- D. Each vacuum circuit breaker cubicle shall have IR windows installed, to enable use of infrared cameras without opening the breaker cubicle, as manufactured by Fluke, FLIR, Colbert Infrared Systems, or Engineer Approved Equal.
- E. Provide a tripping relay on the door of each vacuum breaker. Controls shall coordinate trip settings with the feeder breaker and upstream protection. Provide both over-current and ground fault sensing and tripping with solid state adjustable SEL relays; provide trip curves for the relays. Trip relays shall have selectable long-time trip curves, short-time trip settings and instantaneous current settings for phase currents, time delay and current settings for ground fault currents, and zone selective interlocking to delay tripping of the main breaker when any feeder breaker senses the fault current. Relays shall be Schweitzer SEL-351A, or Engineer Approved Equal.
- F. Instrumentation and controls for each vacuum breaker:
 1. Each breaker shall have a close switch, a trip switch plus red and green pilot lights for closed/tripped position, a tripping relay, all on the front of the draw-out breaker door. They shall also have a C/T shorting device and an anti-pumping relay mounted inside behind the breaker door.
- G. Potential Transformers (PT's)
 1. Provide one draw-out PT for closing circuit breakers. Provide three (3) draw-out PT's for tripping relays.
- H. Current Transformers (CT's)
 1. Provide three (3) C/T's for each vacuum breaker.
 2. The current transformers on each vacuum breaker shall be rated as follows:
 - a. Primary and secondary breaker sizes as indicated on the drawings: Burden B0.5, accuracy 0.3, class C50.

2.09 CONTROL POWER TRANSFORMER

- A. The control power transformer shall be rated 25kVA, 6.6kV-120/240V, 1-phase, 3-wire, 60 Hz. The transformer primary shall have copper windings, with a cast epoxy primary and resin impregnated secondary windings, or Engineer Approved Equal. Transformer shall have (2) taps, (1) at +2.5%, and (1) at -2.5%.

2.10 NAMEPLATES:

- A. Provide engraved phenolic nameplates for electrical equipment identification for each cubicle, and instrument for the entire switchgear line-up. The central nameplate for the switchgear shall include, voltage, phase and short circuit rating. Each circuit breaker and each switch nameplate shall include load designation, circuit breaker or switch size and type. Furnish complete list with submittal. Provide all OSHA required labels.
- B. Provide one job nameplate on the main breaker line-up with the following information:
 - 1. Port of Tacoma Terminal #3 (or Port of Tacoma Terminal #4)
 - 2. Elcon Associates, Inc. – Seattle, WA
 - 3. Electrical Contractor's Name
 - 4. Year of manufacture

2.11 PRIMARY RISER DIAGRAM:

- A. Provide a primary system riser diagram(s) that shows switchgear line up, bussing and wiring connections. Diagram shall utilize non-fading ink and paper sealed in plastic and mounted to the exterior of the main breaker line-up within the enclosure a plexi-glass front frame. Submit preliminary draft to project Engineer for approval prior to final fabrication.

2.12 WARRANTY

- A. Provide an equipment warranty for the 15KV switchgear line-up. This equipment warranty shall cover a five (5) year period after date of substantial completion.

2.13 FINISHES

- A. Enclosure Coating System for Outdoor Units: Comply with ANSI C57.12.28 regardless of transformer type.

2.14 SHORT CIRCUIT, COORDINATION, AND ARC FLASH STUDY

- A. Factory Tests: Design and routine tests shall comply with referenced standards, per Section 26 05 73 – Overcurrent Protective Device Coordination Study.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Comply with IEEE C2.
- B. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
 - 1. Mark lugs after torquing with red paint such that paint will be visibly disturbed if lugs are disturbed.

3.02 IDENTIFICATION

- A. Provide labels for enclosures and components as specified in Division 26, Section "Identification for Electrical Systems."
- B. Interior Labels: Provide engraved plastic laminate labels, white letters on black background, 1" high minimum for the following:
 - 1. Both sets of medium-voltage bushing wells (H1A, H2A, H3A and H1B, H2B, H3B).
 - 2. Secondary bushings (X0, X1, X2, X3).
 - 3. Vacuum/pressure gauge.
 - 4. Dial type thermometer
- C. Provide warning and caution signs, where indicated or required by the Authority Having Jurisdiction.

3.03 FIELD QUALITY CONTROL

- A. Manufacturer's Field Services: Engage a qualified factory-trained representative to assist in installation and start-up. Manufacturer's representative shall provide technical direction and assistance to Contractor in general assembly of medium voltage power substations, connections and adjustments, and testing.
- B. Seismic Anchoring: Meet the seismic requirements of Section 26 05 48 - Seismic Controls for Electrical and Communication Work. Refer to Division 3 for Cast-In-Place Concrete for anchor bolts.
- C. Grounding: Comply with Division 33, Section "Site Grounding" for materials and installation requirements.
 - 1. Separately Derived Systems: Secondary of transformers shall be grounded through a neutral grounding resistor (NGR) as shown on the drawings and specified herein. Make grounding connections to grounding electrodes and bonding connections to metallic piping to comply with NFPA 70 and Division 33, Section "Site Grounding."

3.04 FIELD TESTING

- A. Installing Contractor Inspection and Testing: Prior to acceptance testing by an independent testing agency, the installing Contractor shall perform the following:
 - 1. Inspect accessible components of entire medium voltage power substations for cleanliness, mechanical and electrical integrity, and damage or deterioration. Verify that temporary shipping bracing has been removed. For power dry-type transformers, include internal inspection through access panels and doors.
 - 2. Inspect bolted electrical connections for tightness.
 - 3. Perform ground resistance test.

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4. Perform insulation-resistance tests using a megohmmeter. Record results of primary and secondary winding-to-winding and winding-to-ground with test voltage.
 - a. For Windings' Ratings from 5000 to 35,000V: Use 5000V dc minimum test voltage; 25,000 megohms for dry-type transformers.
 - B. Independent Testing Agency: Engage an independent electrical testing agency per NETA requirements to test and certify medium-voltage power transformers' installations as specified in Section 26 01 26 "Acceptance Testing of Electrical Systems."
 1. Electrical Contractor shall accompany the independent testing firm field service technician and assist as required during field tests.
 - C. Test Failures: Compare test results with specified performance or manufacturer's data. Correct deficiencies identified by tests and retest. Verify that transformers meet specified requirements.
- 3.05 CLEANING
- A. Upon completion of installation, inspect components of medium voltage power substations, remove paint splatters and other spots, dirt, and debris. Repair scratches and mars on finish to match original finish. Clean components internally using methods and materials recommended by manufacturer.
- 3.06 ADJUSTING
- A. Adjust transformer taps to provide optimum voltage conditions at utilization equipment throughout normal operating cycle of facility. Record primary and secondary voltages and tap settings and submit with test results.
- 3.07 DEMONSTRATION AND TRAINING
- A. Training: Provide a factory-authorized service representative to demonstrate medium voltage power substations' operation and maintenance and provide training for Port maintenance personnel for one 8-hour work day at the job site location. Training shall include instructions on the following:
 1. Safety precautions.
 2. Features and construction of project medium voltage power substations and accessories.
 3. Routine inspection, test, and maintenance procedures.
 4. Routine cleaning.
 5. Features, operation, and maintenance of integral medium voltage disconnect switches, medium voltage circuit breakers, relays and controls.
 6. Interpretation of readings of indicating and alarm devices.

7. Protective-relay setting considerations.
 8. Features, operation, and maintenance of separable, insulated, connector system.
 9. Tap-changing procedures for the transformers.
- B. Schedule training and provide notification to the Port at least 7 days in advance.

3.08 CERTIFICATE OF COMPLIANCE

- A. A qualified factory-trained manufacturer's representative shall certify in writing that the medium voltage power substations' equipment has been installed, adjusted and tested in accordance with manufacturer's recommendations.
- B. Installing Contractor shall provide three copies of certificates to the Port.

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 01 26 – Acceptance Testing for Electrical Systems
 2. Section 26 05 00 – Common Work Results for Electrical
 3. Section 26 05 19 – Low Voltage Electrical Power Conductors and Cables
 4. Section 26 05 33 – Raceways and Boxes for Electrical Systems
 5. Section 26 05 48 – Seismic Controls for Electrical and Communications Work
 6. Section 26 05 53 – Identification for Electrical System
 7. Section 26 05 73 – Overcurrent Protective Device Coordination Study
 8. Section 26 12 16 - Medium Voltage Power Substations
 9. Section 26 43 13 – Surge Protective Devices
 10. Section 33 77 00 - Medium Voltage Shore Power Switches in Walk-In Enclosure

1.02 WORK INCLUDED

- A. Provide all panelboard equipment complete. All equipment shall be dead front type construction and shall bear the U.L. label. Load centers will not be acceptable.

1.03 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.

1.04 SUBMITTALS

The following information shall be submitted in accordance with Section 01 33 00 – Submittal Procedures:

- A. Product Data: For each type of panelboard, switching and overcurrent protective device, transient voltage suppression device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.
- B. Shop Drawings: For each panelboard and related equipment.
1. Include dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings.
 2. Detail enclosure types and details for types other than NEMA 250, Type 1.
 3. Detail bus configuration, current, and voltage ratings.
 4. Short-circuit current rating of panelboards and overcurrent protective devices.
 5. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.

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6. Include wiring diagrams for power, signal, and control wiring.
 7. Include time-current coordination curves for each type and rating of overcurrent protective device included in panelboards. Submit on translucent log-log graph paper; include selectable ranges for each type of overcurrent protective device.
- C. Qualification Data: For qualified testing agency.
- D. Seismic Qualification Certificates: Submit certification that panelboards, overcurrent protective devices, accessories, and components will withstand seismic forces defined in Division 26 Section "Vibration and Seismic Controls for Electrical Systems." Include the following:
1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- E. Field Quality-Control Reports:
1. Test procedures used.
 2. Test results that comply with requirements.
 3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.
- F. Panelboard Schedules: For installation in panelboards.
- G. Operation and Maintenance Data: For panelboards and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:
1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
 2. Time-current curves, including selectable ranges for each type of overcurrent protective device that allows adjustments.

1.05 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA or an NRTL.
1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.
- B. Source Limitations: Obtain panelboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.
- C. Product Selection for Restricted Space: Drawings indicate maximum dimensions for panelboards including clearances between panelboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.

- D. 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.
- E. Comply with NEMA PB 1.
- F. Comply with NFPA 70.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Siemens
- B. Eaton
- C. General Electric
- D. Square D
- E. Or Engineer Approved Equal

2.02 PANELBOARD DESCRIPTION

- A. Voltage, arrangement, and capacity of bus and overcurrent protective devices shall be as shown on the drawings. Bus shall extend behind all spaces ready for future overcurrent protective devices.
- B. Buss bars shall be plated copper with ampere density not-to-exceed 1200/1000 amperes per square inch. Bussing will be 3-phase, 4-wire, or 1-phase, 3-wire, 100 percent neutral, braced to match the interrupting rating of the breakers.
- C. Provide separate neutral and ground buses at the bottom of each panelboard.

2.03 OVERCURRENT PROTECTIVE DEVICES

- A. The AIC rating of the panel shall be as specified on the drawings.
- B. Mount breakers in all panelboards so breaker handle operates in a horizontal plane. Provide common trip on all multiple pole breakers.
- C. All circuit breakers shall be solid state bolt-on type. All circuit breakers 200 amps and above shall be rated 100%.
- D. Circuit Breakers rated 15A through 30A shall be U.L. rated for 60/75-degree centigrade wire. Breakers 35A and larger shall be rated for 75-degree centigrade.
- E. Circuit breakers intended for switching 120 Volt loads shall be switching duty rated (SWD).
- F. Provide "Spare" overcurrent devices, where noted on the drawings, complete and ready for future circuit connections.
- G. Provide "Space" for future overcurrent devices, where noted on the drawings. Space shall include all bussing and device mounting hardware. Provide approved cover-plates or overcurrent devices in all spaces. Open spaces in the panel are not permitted.

2.04 ENCLOSURE GENERAL CONSTRUCTION

- A. Provide cabinets of sufficient dimensions to allow future addition of overcurrent devices within the panelboards. All panelboards shall be provided with door-in-door construction. Provide increased enclosure width required for installation of conduits.
- B. Provide panelboards in NEMA 3R enclosures for the power substations and NEMA 1 enclosures for the walk-in enclosures.
- C. All electrical distribution equipment locks shall be keyed identically.
- D. Fasten panelboard front with machine screws with oval counter-sunk heads, finish hardware quality, with escutcheons or approved trim clamps. Clamps accessible only when dead front door is open are acceptable.
- E. A Surge Protective Device (SPD) shall be provided for each panelboard.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION

- A. Secure panelboards in place with top of cabinet at 6'-0", above finished grade unless otherwise noted. Top of cabinet and trim shall be level; trim and door shall fit neatly without gaps, openings or distortion.
- B. Securely anchor panelboards to structural framing with stainless approved fasteners and concealed bracing as required.

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, with odd numbers on the left and even numbers on the right. Mount index with a transparent protective cover inside the cabinet door.
- B. Contractor shall provide a typed duplicate index for each panel in the O & M manuals.

3.03 PANELBOARD NAMEPLATE

- A. Provide phenolic engraved nameplate for each panelboard.

END OF SECTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Receptacles, receptacles with integral GFCI, and associated device plates.
 - 2. Twist-locking receptacles.
 - 3. Receptacles with integral surge suppression units.

1.03 DEFINITIONS

- A. EMI: Electromagnetic interference.
- B. GFCI: Ground-fault circuit interrupter.
- C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.
- D. RFI: Radio-frequency interference.
- E. SPD: Surge Protective Device.

1.04 SUBMITTALS

The following information shall be submitted in accordance with Section 01 33 00 – Submittal Procedures:

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: List of legends and description of materials and process used for pre-marking wall plates.
- C. Field quality-control test reports.
- D. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing label warnings and instruction manuals that include labeling conditions.

1.05 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of wiring device and associated wall plate through one source from a single manufacturer. Insofar as they are available, obtain all wiring devices and associated wall plates from a single manufacturer and one source.
- B. Electrical Components, Devices, and Accessories: UL Listed and Labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with NFPA 70.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:

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1. Cooper Wiring Devices; a division of Cooper Industries, Inc. (Cooper).
 2. Hubbell Incorporated; Wiring Device-Kellems (Hubbell).
 3. Leviton Mfg. Company Inc. (Leviton).
 4. Pass & Seymour/Legrand.
 5. Or Engineer Approved Equal

2.02 STRAIGHT BLADE RECEPTACLES

- A. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 configuration 5-20R, and UL 498.
 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Cooper; 5351 (single), 5352 (duplex).
 - b. Hubbell; HBL5351 (single), CR5352 (duplex).
 - c. Leviton; 5891 (single), 5352 (duplex).
 - d. Pass & Seymour; 5381 (single), 5352 (duplex).
 - e. Or Engineer Approved Equal.
- B. Isolated-Ground, Duplex Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 configuration 5-20R, and UL 498.
 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Hubbell; CR 5253IG.
 - b. Leviton; 5362-IG.
 - c. Pass & Seymour; IG6300.
 - d. Or Engineer Approved Equal.
 2. Description: Straight blade; equipment grounding contacts shall be connected only to the green grounding screw terminal of the device and with inherent electrical isolation from mounting strap. Isolation shall be integral to receptacle construction and not dependent on removable parts.

2.03 GFCI RECEPTACLES

- A. General Description: Straight blade, feed-through type. Comply with NEMA WD 1, NEMA WD 6, UL 498, and UL 943, Class A, and include indicator light that is lighted when device is tripped.
- B. Duplex GFCI Convenience Receptacles, 125 V, 20 A:
 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Cooper; GF20.
 - b. Pass & Seymour; 2084.
 - c. Or Engineer Approved Equal.

2.04 WALL PLATES

- A. Single and combination types to match corresponding wiring devices.

-
1. Plate-Securing Screws: Metal with head color to match plate finish.
 2. Material for Finished Spaces: 0.035-inch- thick, satin-finished stainless steel.
 3. Material: Galvanized steel.
 4. Material for Damp Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in "wet locations."
- B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with type 3R weather-resistant, die-cast aluminum with lockable cover.

2.05 FINISHES

- A. Color: Wiring device catalog numbers in Section Text do not designate device color.
1. SPD Devices: Blue.
 2. Isolated-Ground Receptacles: As specified above, with orange triangle on face.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Comply with NECA 1, listed in that standard, unless otherwise noted.
- B. Coordination during installation:
1. Take steps to ensure that devices and their boxes are protected. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of the boxes.
 2. Keep outlet boxes free of materials that may contaminate the raceway system, conductors, and cables.
- C. Conductors:
1. Do not strip insulation from conductors until just before they are spliced or terminated on devices.
 2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
 3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
- D. Device Installation:
1. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
 2. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
 3. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
 4. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, 2/3 to 3/4 of the way around terminal screw.

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5. Use a torque screwdriver when a torque is recommended or required by the manufacturer.
 6. Tighten unused terminal screws on the device.
- E. Receptacle Orientation:
1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the left.
- F. Device Plates: Do not use oversized or extra-deep plates.
- G. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top.
- 3.02 IDENTIFICATION
- A. Comply with Division 26 Section "Identification for Electrical Systems."
1. Receptacles: Identify panelboard and circuit number from which served. Use hot, stamped or engraved machine printing with white-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.
- 3.03 FIELD QUALITY CONTROL
- A. Perform tests and inspections and prepare test reports.
1. Test Instruments: Use instruments that comply with UL 1436.
 2. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated LED indicators of measurement.
- B. Tests for Convenience Receptacles:
1. Line Voltage: Acceptable range is 105 to 132 V.
 2. Percent Voltage Drop under 15-A Load: A value of 5 percent or higher is not acceptable.
 3. Ground Impedance: Values of up to 2 ohms are acceptable.
 4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
 5. Using the test plug, verify that the device and its outlet box are securely mounted.
 6. The tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.

END OF SECTION

PART 1 - GENERAL

1.01 SCOPE

- A. The contractor shall furnish and install metal enclosed automatic power factor correction capacitor equipment, as specified herein and as shown on the contract drawings.
- B. This specification contains the minimum requirements for the design, manufacture and testing of metal enclosed capacitor bank rated 7.2KV.
- C. This specification covers the electrical characteristics and mechanical features of a three phase, 60 Hertz, self-contained, free standing, metal enclosed automatic power factor correction capacitor bank. The application of these units is for power factor correction.

1.02 STANDARDS

- A. The metal enclosed capacitor equipment shall be designed, manufactured and tested in accordance with the latest standards of NEMA, NFPA 70, IEEE and ANSI.
- B. 600V control wires, 600V control devices and 600V terminal blocks shall be UL listed and labeled.

1.03 SUBMITTALS

- A. The following information shall be submitted in accordance with Section 01 33 00 – Submittal Procedures:
 - 1. Front view elevation
 - 2. Floor plan and/or top view with conduit entry locations
 - 3. Shipping Drawing with dimensions and weight
 - 4. Nameplate Drawing
 - 5. Three-line power diagram
 - 6. Control Schematics
 - 7. Wiring Diagrams
 - 8. Control panel front view layout
 - 9. Installation & Handling Instructions
 - 10. Equipment ratings: Short-circuit rating, Voltage, Continuous current, BIL, Frequency, Full Load Amps, Capacitor bank feeder sizing amps
 - 11. Product data sheets
 - 12. O & M Manual
 - 13. Material Safety Data Sheet for liquids
 - 14. Inspection/Maintenance schedule & checklist
 - 15. Test Reports
 - 16. Quality Checklist
 - 17. Spare Parts List

1.04 QUALIFICATIONS

- A. The manufacturer of the assembly shall be the manufacturer of the enclosure and capacitors. All assembly shall be performed at a manufacturing facility in the USA.
- B. The facility where the equipment is assembled shall be ISO 9001 certified. Supplier to provide ISO 9001 certificate for the facility where the automatic power factor correction capacitor bank will be manufactured.
- C. The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of ten (10) years. The manufacturer shall have a minimum of 25 years of electrical equipment manufacturing presence in USA. The manufacturer shall have at least 400 similar units in operation. An acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.
- D. The manufacturer shall provide calibration report of every piece of test equipment and torque wrench used during the manufacturing process.
- E. The manufacturer shall have work instructions for all manufacturing processes.
- F. Automatic power factor correction capacitor bank assembly shall be engineered, manufactured and tested under the direct supervision of a registered professional electrical engineer.

PART 2 EQUIPMENT

2.01 RATINGS

- A. The system operating nominal voltage and frequency shall be 6.6 kV, 60 Hz.
- B.** The capacitor bank shall be filtered as required.
- C. The total capacity of the metal enclosed capacitor unit shall be 900 KVAR. The total KVAR capacity shall be divided into three (3) 300 KVAR automatically switched in steps of 150 KVAR.
- D. The metal enclosed automatic power factor correction capacitor bank unit shall be a modular design with provisions for expansion to 1,500 KVAR.
- E. The automatic power factor correction capacitor bank shall have the following automatic stages:
Stage 1 - 150 KVAR, Stage 2 - 300 KVAR, Stage 3 - 450 KVAR, Stage 4 - 600 KVAR, Stage 5 – 750 KVAR, Stage 6 – 900 KVAR.
- F. The capacitor bank shall be rated for continuous duty at 40°C ambient at 3,300 ft. and below.
- G. Total harmonic distortion (THD) of up to 5% of voltage waveforms shall not affect the life of capacitors.
- H. A +/- 10% variation in line voltage shall not affect the life of the capacitor.

2.02 ENCLOSURE

- A. Enclosure shall be NEMA 3R outdoor enclosure with gaskets and air filters.

- B. The structure shall be front accessible, free standing with necessary provisions for ventilation and handling. There shall be no side access or operating handles mounted on the side of the enclosure.
- C. The steel thickness of enclosures shall be 11 gauge or equivalent.
- D. The automatic power factor correction capacitor bank line-up shall not have any side access panels. The capacitor bank main and ground switch operators shall be mounted on front so that there is no side access required and side operator clearances are not required.
- E. There shall be thermostatically controlled heaters for condensation control. Each section shall have a space heater and thermostat.
- F. Disposable air filters and stainless-steel screens shall be provided to prevent dust and insect entry. Filters shall be removable for replacement or cleaning purposes from outside without opening enclosure door. Air filters shall be industrial grade and meet UL Standard 900 and CAN-4-S111. Air filters shall be constructed with heavy duty, premium grade fiberglass media. Air filters shall have double-sided expanded metal retainers, on both the air-entering and air-leaving sides, for maximum rigidity and durability. Air filters dimensions shall be 14" x 24" x 1".
- G. Structures shall be bolted stainless steel mounting frame, formed steel doors and side sheets, flat and sloped to rear steel top and rear covers. All enclosure outside sheets shall be internally bolted such that no bolts or hardware is exposed to outside.
- H. Thermostatically controlled forced air ventilation shall be provided in all compartments. Each section with capacitor and reactor shall have minimum two cooling fans controlled by a dedicated thermostat. All louvered openings for air flow shall have stainless steel insect screens.
- I. The automatic power factor correction capacitor bank shall be modular design for ease of future expansion. If future expansion is required then the last section shall have a bus cut-out opening with weather proof bolted gland plate.
- J. Automatic power factor correction capacitor bank shall have a 4" stainless steel base channel. The bottom sides shall have skirt plates so that there is no access to animals under the capacitor bank. The bottom plates of the capacitor bank enclosure shall be 4" above the ground.
- K. Each section door shall have a viewing window. Viewing window glass shall be double pane with ASTM rating. Viewing window shall be 10.5" X 7.0". Viewing window shall be reinforced with brackets on the rear side of the door.
- L. Each stage of the automatic power factor correction capacitor bank shall be installed in an individual compartment isolated by steel sheets from other stages.
- M. The equipment shall be modular design with maximum 90" wide x 49" deep sections. Each shipping section shall weigh less than 6000LBS for ease of handling and installation on site. The equipment shall be designed and shipped in sections such that no large lifting cranes are required on site. The shipping sections shall be designed such that they can be moved on pallets using regular fork lift truck.
- N. Each modular 45" wide section shall have dedicated thermostats, space heaters, and cooling fans.

- O. The equipment shall be shipped on wood pallets for ease of handling and installation. Each shipping section shall have removable lifting eyes on each corner.
- P. Each section door shall have warning labels, danger high voltage, section #, and caution labels.
- Q. The enclosure steel shall be fabricated at the same facility where the automatic power factor correction capacitor bank is assembled.
- R. The doors shall have gaskets, heavy-duty non-corrosive hinges, pad lockable and keyed heavy-duty non-corrosive handles. The doors shall be latched at three points. Doors shall have welded grounding studs and shall be bonded to the equipment ground bus.
- S. The door hinge pins shall be stainless steel. There shall be six heavy duty hinges for each door. The doors shall have door stops. The door latching mechanism shall have heavy duty rollers on all three latching points.
- T. The roof shall be sloped to the rear. There shall be a drip shield provided over each door. The drip shield shall be welded to the top of the frame. The drip shield shall extend 3" from the door front surface. The top roof sheet shall have welded braces for rigidity and weight support.
- U. Each unit shall have a rating nameplate. The lettering shall be black 3/16-inch high, on a silver background.
- V. The main incoming section shall have a rating nameplate located on the inside door in addition to the external nameplate.
- W. Metal enclosed automatic power factor correction capacitor equipment enclosures shall be provided with a powder coat paint finish. Exterior color shall be ANSI 61 light gray.
- X. Automated and continuously monitored electrostatic powder coat line operation shall be used. Each steel piece shall be pretreated, coated, and cured. The overall paint type and process shall meet UL1332 standard for organic coating of steel enclosures for outdoor electrical equipment use.
- Y. Powder paint properties shall be as follows:
 - 1. Color: Medium Gray – ANSI 61 (Munsell 8.3G/6.10/0.54)
 - 2. Paint Process Electrostatic Application of Powder Paint
 - 3. Specific gravity: 1.5 to 1.75
 - 4. Application Voltage: 50 to 100 kilovolts
 - 5. Film thickness: 1.5 – 2.5 mils
 - 6. Cure schedule: 30 minutes at 380°F
 - 7. Salt spray: The enamel film should be exposed in a salt spray cabinet conforming to ASTM B 117. Using a razor blade, scribe a single vertical line per ASTM D 1654 through the enamel to bare metal. The panels shall be supported at 15-degree angle from the vertical and shall be exposed for 600 hours to a 5 percent salt fog maintained at a temperature of 35°C (95°F). Panels shall show

no breakdown further than 1/8 inch from the scribe. Minimum rating of "5" per ASTM D 1654, Procedure A, Method 2.

8. Painting process shall be as follows:
 - a. Spray de-grease and clean
 - b. Alkaline wash
 - c. Iron phosphate spray coating
 - d. Spray rinse
 - e. Oven dry 300°F
 - f. Electrostatic powder spray paint coating
 - g. Oven cure 300°F to 400°F

Z. Each shipping section shall have temporary labels identifying the shipping section number. All shipping split hardware shall be included with the equipment.

2.03 INCOMING SECTION

- A. Unit shall have an integrally mounted, assembled isolation disconnect and grounding switch.
- B. Distribution class polymer arresters shall be provided for lightning protection. Arrester MCOV Rating shall be 50kV. All arrester shall be tested for 100% partial discharge inception voltage and 100% 60Hz sparkover level. Arresters shall be constructed of metal oxide varistors in series with insulating ceramic ring assembly. The components of the arrester shall be encapsulated. The arrester terminal & cap shall be stainless steel.
- C. Main switch and ground switch shall have externally operable handles with padlocking provisions.
- D. Control power transformer shall be provided in each incoming section. The primary of the CPT shall be fused. Provide two CPTs for all three-phase voltage sensing.
- E. Incoming section shall be designed for bottom customer power cable entry. A removable bolted cover plate shall be provided.
- F. The incoming section shall have adequate power cable bending radius space for customer's cables.
- G. The incoming section shall have cable supports for customer's power cables. Customer's power cable terminations shall be NEMA 2-hole or NEMA 4-hole depending upon the maximum current of the capacitor bank.
- H. Insulated barriers shall be provided between phases.

2.04 SWITCH

- A. Main switch
 1. The main switch shall be 3-pole, load break with puffer type arc extinguishing system. The switch mechanism shall be single spring action which opens or closes by charging the spring past dead center. The switch shall use chain drive

handle. Main switch shall have externally operable handles with padlocking and kirk key interlocking provisions.

2. 15KV Class Capacitor Bank Main Switch Ratings:

- a. Maximum rated voltage 17KV.
- b. 200A Continuous Current
- c. Pole spacing: 9.25"
- d. Impulse level 110kV BIL and 60Hz 1 minute withstand level 50kV
- e. Momentary Withstand & Fault Close Rating: 40kA Asymmetrical
- f. Short time Fault Withstand Rating: 25kA Symmetrical for 2 seconds
- g. Switch opening time 40 – 60 ms

B. Ground switch

1. Ground switch shall be provided in the incoming section to ground the 3 phases to ground.
2. Ground switch shall be rated for 40kA Momentary Withstand rating.
3. Ground switch shall be 3-pole switch interlocked with the main switch.
4. Ground switch shall have externally operable handles with padlocking and kirk key interlocking provisions.

2.05 CAPACITOR UNIT

- A. Capacitor unit shall be mounted upright with bushings on top. Bushings for 1-phase tanks shall be porcelain glazed for high strength and durability. Bushings shall be hermetically sealed to the capacitor tank.
- B. Capacitor unit shall be stainless-steel tank with light gray finish. The tank shall have stainless-steel mounting brackets. The underside of each bracket shall be unpainted for positive grounding.
- C. Capacitor units shall be constructed with all-film, extended-foil elements, solderless connections, and laser-cut aluminum foil.
- D. Capacitor units shall be low dielectric loss 0.05 watt/kvar.
- E. Each capacitor unit shall be equipped with internal discharge resistors to reduce terminal voltage to 50 volts or less within five minutes after the capacitor has been disconnected.
- F. Each capacitor unit shall have a stainless-steel nameplate and a blue non-PCB decal.
- G. Capacitor unit rated nameplate voltage and continuous overvoltage capability shall be selected such that the capacitors can withstand overvoltage conditions due to system contingencies, system over-voltages, switching transients and capacitor bank unbalance conditions.

- H. Capacitor units shall be manufactured at an ISO 9001 certified facility. Capacitor units shall be designed, manufactured, and tested per the latest IEEE Standard 18.
- I. CAPACITORS FOR “HARMONIC FILTER” BANKS:
1. Capacitor shall be suitable for operation at 125% of rated nameplate voltage, and 135% of rated nameplate current minimum.
 2. For 5kV Class the capacitors shall be connected in Delta configuration. For 15kV Class the capacitor shall be connected in Wye (Star) configuration.
 3. Each capacitor case shall be grounded to the enclosure ground bus. Capacitors for harmonic filter applications shall be heavy duty, -50°C to +55°C temperature rating, 125% continuous over-voltage capability above rated nameplate, 15kA fault handling capability, 100KA transient current withstand capability, and meet IEEE Std. 18, NEMA and IEC standards.
 4. Capacitor units for filter applications shall be 1-phase/2-bushing.
The capacitor shall be sized per the harmonic filter design duty. Continuous current and voltage rating of the capacitor bank shall be based upon the harmonic current spectrum specified.

2.06 BUS, CABLE & TERMINALS

- A. Main and Ground bus shall be silver or tin plated.
- B. Main bus shall be provided and properly sized to handle continuous current rating of capacitor bank as well as a minimum of 50% for future expansion to 1,500 KVAR.
- C. Ground bus shall be provided in each section for the entire length of the capacitor bank. A ground pad with holes shall be provided on each end for landing external ground cables.
- D. The copper bus shall have rounded edges.
- E. Copper bus shall be braced for the available system short circuit current at the capacitor bank bus.
- F. Main bus support insulators shall be 95kV BIL.
- G. All live copper connections shall be made using long barrel compression lugs with minimum double crimping on each lug. Mechanical type cable terminations shall not be allowed for any current carrying terminals.
- H. All live terminations shall be with bolts, nuts, flat washers and Belleville washers.
- I. All power cables shall be 15kV Class, 90°C, EPR insulation. The conductors shall be tin coated soft annealed copper and flexible bunch with high standing. The insulation thickness shall be 210 Mils.

2.07 VACUUM CONTACTORS

- A. Vacuum contactors shall be rated for capacitive switching.
- B. Vacuum contactors shall be rated for 15kV, 3-pole.
- C. Each vacuum contactor shall be grounded to the enclosure ground bus.
- D. Contactors shall be rated for switching of capacitors by the contactor manufacturer.

E. 15KV CLASS APPLICATION:

1. The vacuum contactor shall be rated 15KV, 1-pole, 200A.
2. Vacuum contactor shall meet ANSI Standard C37.66.
3. Vacuum Contactor high frequency transient making capacity shall be 12000A
4. Vacuum Contactor Short Term withstand rating shall be 4500A for 1 sec / 6000A for 0.5 sec.
5. Vacuum Contactor Momentary Withstand rating shall be 9,000A Asymmetrical.
6. Vacuum Contactor mechanical life shall be 10,000 operations
7. Vacuum Contactor BIL rating shall be 95kV.
8. Vacuum Contactor 60Hz dielectric strength shall be 35kV for 1 minute dry.
9. Vacuum Contactor shall be motor operated mechanically latched type.

2.08 REACTORS**A. Iron core reactors for tuned & de-tuned harmonic filter capacitor bank:**

1. The reactors for harmonic filter capacitor banks shall be iron core type.
2. The reactors shall be rated 115°C temperature rise with 220°C Nomex insulation system.
3. The reactors shall be vacuum pressure impregnated with varnish. The varnish color shall be light brown.
4. The reactors shall be manufactured using high quality steel for the core.
5. Iron core reactors coils shall be 100% copper.
6. The reactor shall be tuned to the required harmonics.
7. Reactors shall be open frame construction. For 5kV class the reactors shall be rated 60kV BIL. For 15kV class the reactors shall be rated 95kV BIL.
8. Reactors shall be sized MINIMUM 160% of full load amps. Reactors shall be sized for the current harmonic spectrum.

2.09 KEY INTERLOCK SYSTEM

- A. Key Interlock system shall be using Kirk Key Company locks.
- B. Unit main disconnect shall have Kirk Key Co. lock that, when switch is open, key is removable to unlock opened position on ground switch.
- C. The ground switch can then be closed and shall have key interlocks that can be removed in closed position to allow for unlocking doors.
- D. The ground switch cannot close unless the disconnect switch is locked open. The ground switch cannot open unless all the capacitor section doors have been locked closed.
- E. Each door handle shall be heavy duty with padlocking provisions and shall have a keyed lock in the handle.
- F. Kirk key lock covers shall be stainless-steel and shall be installed with stainless-steel bolts.

2.10 NAMEPLATES

- A. Capacitor bank rating nameplate shall be provided on the main section on the outside and inside.
- B. The rating nameplate shall have the following information:
 - Voltage, Full load amps, Frequency, Fluid volume, Serial number, Part number, Eaton order number, Number of stages, Number of enclosure sections, Main disconnect switch rating, Main fuse current rating, & Main fuse interrupting rating.
- C. Each section shall be identified with Section # and Stage #.
- D. Each section shall have a 9" x 5" high voltage danger sign.
- E. Each section shall have a caution sign for disconnect before serving and wait 5 minutes before opening enclosure.
- F. The main switch and ground switch shall be identified with engraved nameplates.

2.11 CONTROL SECTION

- A. Construction
 - 1. The control panel shall be flush mounted on the main incoming section door.
 - 2. The control panel shall have a clear lexan window such that all the indicating lights and meters are visible without opening the control panel door.
 - 3. The control panel shall have a thermostatically controlled cooling fan.
 - 4. The control panel front and rear panel shall be white color.
 - 5. All devices shall be identified with a device tag.
 - 6. All front panel devices shall have engraved nameplates.
- B. Power Factor Controller (For automatic capacitor banks):
 - 1. Power factor controller shall have LCD with backlit and shall be rated for -20°C to +70°C ambient operating temperature and 98% humidity.
 - 2. Programmable set points for all functions. Power factor controller shall have password protection. All alarms shall be displayed on the LCD.
 - 3. High harmonic content (>5% THD voltage) alarm.
 - 4. Power factor controller shall have the following alarm options which can be programmed by the Customer: over/under compensation, no current signal, step fault, step warning, 20X switching time outside limit, voltage harmonic limit, current harmonic limit, and over/under voltage.
 - 5. Power factor controller shall have field adjustable phase compensation so that the user can connect the current and voltage measurement signals in any phase orientation so that the user does not have to physically rotate the power cable and/or CT leads to achieve a particular phasing between current and voltage.
 - 6. Power factor controller shall have individual discharge time programmable for each step. Controller shall be capable of programming two target power factors. Controller shall have an adjustable switch interval time delay between

switching steps in regulation. The controller shall have an adjustable step exchange switch interval time delay for switching-off an active step and switching-in the next step to achieve better power factor.

7. Controller shall have control halt and control sleep on/off settings for each control alarm.
8. Controller shall have a digital relay output in addition to the alarm output. All output contacts shall be rated 5A/250VAC.
9. Controller shall have programmable switch cycle balancing, step exchange and control sensitivity settings.
10. Controller shall have the option of turning on/off the automatic step recognition feature. Controller shall have the capability to program the actual rated KVAR of each stage.
11. Controller shall display current, voltage, Current THD, Voltage THD, KVA, KW, KVAR, Power Factor, Hz, current & voltage harmonics.
12. Controller shall be UL listed and labeled.

C. Multifunction Meter & Relay:

1. Each stage shall have a digital multifunction meter/relay (MMR) for 3-phase True RMS current, voltage, & KVAR sensing and display.
2. The multifunction meter/relay (MMR) shall provide current unbalance, current overload, & overvoltage protection functions for each stage.
3. The MMR trigger parameters shall include adjustable pick-up, drop-out, on delay and off delay settings.
4. The MMR I/O shall have 2 digital outputs and 4 digital inputs. The relay DIO contacts shall be rated 250V/5A.
5. The MMR sampling rate measurement shall be 128 samples per cycle.
6. The MMR shall have bright 3-row LED display.
7. The MMR shall have 2-wire RS-485 communications port with Modbus RTU, DNP3 and ASCII communications protocol.
8. The MMR shall be suitable for 60°C ambient temperature and 95% humidity.
9. The MMR current input shall be rated to withstand 15A RMS continuous and 300A RMS for 1 sec.

D. Other:

1. Adjustable stage anti-cycling timers. Manual-Off-Auto toggle switches shall be provided for operation of the switched steps.
2. Vacuum contactors shall be controlled using interposing control relays with contacts rated 10A/120Vac.
3. All alarm/trip/status indicating lights shall be 120Vac LED.

4. Each stage shall have Manual-Off-Auto switches, stage on indicator, and counter. The control scheme shall be such that when switching from “Manual” position to “OFF” to “AUTO” or “MAN” position on any stage, that the corresponding stage will not be energized in less than 5 minutes. An interposing timing relay shall be provided to prevent energization of the capacitor stage in less than 5 minutes.
5. Control panel shall be designed for future addition for two stages.
6. Over-temperature alarm LED & trip shall be provided for each stage for harmonic filter capacitor banks.
7. Space heater circuit shall be such that the customer can bring external power source if needed to power space heaters during storage.
8. Control panel shall have 120V circuit breaker for disconnecting and over-current protection of control wiring. Separate control circuit breakers shall be provided for control circuit, vacuum contactor control, space heater circuit, and cooling fan circuit. All control circuit breakers shall be rated 10kAIC,120Vac.
9. The control shall have on delay timers as protection against upstream utility reclosers opening and closing to clear distribution line faults. The start timer shall be adjustable.
10. All timers and settings shall be field adjustable.
11. All alarms and trips shall be wired to an adjustable on-delay alarm timer relay. One common alarm dry contact shall be wired out to terminal blocks for Customer’s remote alarm. One common wetted 120Vac alarm contact shall be wired out to terminal blocks for Customer’s use. Loss of control power alarm shall be wired to the capacitor bank common alarm. Loss of vacuum contactor power and cooling fan power shall be wired to the capacitor bank common alarm and indicated on the front panel LED indicating light.
12. All control wiring shall be minimum #14AWG, SIS, XLPE, 600V, FT2, 125°C, UL/CSA Listed. All wire terminations shall be identified with wire markers.
13. All control wires in control panel shall be routed in wire-ways with covers.
14. All terminal blocks shall be rated 50A, 600V.
15. Shipping split control wiring shall have locking type male/female plugs rated 19A, 600Vac.

2.12 CAPACITOR BANK PROTECTION

- A. Capacitor bank main bus shall be protected with current limiting full voltage rated fuses with blown fuse indication. Fuses shall be 50kAIR rated for the full system voltage class.
- B. Current transformer shall be provided for each phase to monitor each stage of capacitor bank current. Current transformers shall be multi-ratio with 10 ratio taps so that the ratio can be adjusted for future expansion.
- C. Current limiting capacitor fuses with current and voltage ratings appropriate for the capacitor shall protect the stage and capacitors.
- D. Capacitor rated fuse shall be provided per each capacitor tank unit.

- E. Current unbalance and current overload protection trip shall be provided for each stage.

PART 3 TESTING, QUALITY CONTROL & SHIPPING

3.01 COMPONENT PRODUCTION TESTING

- A. All capacitors shall be tested in compliance with IEEE requirements for capacitance, dissipation factor, terminal to terminal and terminal to case dielectric strength, and oil leaks. All capacitor cells shall be traceable through construction and testing.
- B. All iron core reactors shall be tested for inductance by applying voltage and measuring current at fundamental.
- C. All power transformers shall be tested for ratio and accuracy.
- D. All multifunction meters shall be tested for operation and accuracy.

3.02 ASSEMBLIES PRODUCTION TESTING

- A. The automatic power factor correction capacitor bank shall be tested for proper operation prior to leaving the factory.
- B. The following checks, measurements, and operations must be confirmed and recorded:
 - 1. Wire connections
 - 2. Torque connections
 - 3. Operation of contactors, heaters, & cooling fans
 - 4. Phase to Phase resistance checks
 - 5. Phase to Phase capacitance checks
 - 6. Controller operation, manual operation
 - 7. Controller operation, automatic operation
 - 8. Insulation resistance Megger test Phase-to-Phase and Phase-to-Ground
 - 9. DC Hi-pot test (DC Hi-pot Level = 2 x System Voltage + 2500V)
 - 10. Test all CT ratios and circuits with primary current injection on main bus.
- C. The certified record of these tests shall become part of the permanent documentation package that travels with the automatic power factor correction capacitor bank

3.03 QUALITY CONTROL

- A. Quality assurance checklist shall be completed for each unit.
- B. The equipment shall be manufactured in an ISO 9001 certified facility.

3.04 SHIPPING

- A. Each shipping section shall be shipped on heat treated wood pallets.
- B. All shipping sections shall be identified & labeled.
- C. All shipping split hardware shall be included with the equipment.
- D. All shipping sections shall be wrapped in heavy duty plastic.

- E. The shipping pallets shall allow 8” clear space all around the enclosure to prevent scratching & damage during shipping, transportation, handling, and installation.
- F. Manufacturer shall provide shipping & handling instructions and MSDS prior to shipping the equipment.

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 13 – Medium Voltage Cables and Accessories
 - 3. Section 26 05 19 – Low Voltage Electrical Power Conductors and Cables
 - 4. Section 26 12 16 - Medium Voltage Power Substations
 - 5. Section 26 24 16 – Panelboards
 - 6. Section 33 77 00 - Medium Voltage Shore Power Switches in Walk-In Enclosures

1.02 SUMMARY

- A. This Section describes the materials and installation requirements for Surge Protective Devices (SPD). SPD's are used for the protection of all AC electrical circuits from the effects of lightning induced currents, substation switching transients and internally generated transients resulting from inductive and/or capacitive load switching.
- B. This specification also describes the mechanical and the electrical requirements for the SPD. The SPD shall be suitable for application in both category B and C environments as described in ANSI/IEEE C62.41- 2002.
- C. The Manufacturer/Vendor shall furnish all of the necessary SPD products and related hardware (i.e., flush mounting kits, mounting brackets, etc.) as required for the installation of surge protective devices.

1.03 DEFINITIONS

- A. ATS: Acceptance Testing Specifications.
- B. VPR: Voltage Protection Rating
- C. SPD: Surge Protective Device
- D. CLF: Component Level Fusing
- E. LIC: Low Impedance Cable
- F. SCCR: Short Circuit Current Rating

1.04 REFERENCE STANDARDS

- A. All manufacturers must comply with the standards listed below and any additional current revisions of industry standards. All products that do not comply with current industry standards will not be accepted.
 - 1. Underwriters Laboratories 1449 – (UL 1449) 3rd Edition
 - 2. NEC article 285. National Electrical Code 2014

3. NFPA 780 Standard for the installation of lightning protection systems
4. UL96A – Lightning Protection System Master Label
5. IEEE (Institute of Electrical and Electronic Engineering Inc.) Latest Revision C62.41.1, C62.41.2, C62.45, C62.33 & C62.35
6. Previous NEMA LS-1 testing standards
7. ISO 9001 (International Organization for Standardization) Quality Systems – Quality Management System

1.05 SUBMITTALS

- A. Submittals shall be per Section 01 33 00 – Submittal Procedures.
- B. Submit the following information, indexed by response and test results.
 1. Specification compliance response sheet referencing each specification section.
 2. Proof of UL1449 Third Edition compliance from Nationally Recognized Test Lab (NRTL) accepted by local authority having jurisdiction. UL1449 Third Edition Nominal Discharge Current Rating and Voltage Protection Ratings shall be provided.
 3. Published specifications, cut sheets & product data with appropriate IEEE C62.41 & UL1449 Third Edition performance ratings for intended installation locations.
 4. Electrical and mechanical shop drawings.
 5. Installation requirements/instructions.
 6. Operations & maintenance manuals.
 7. Performance / warranty information.
- C. Operation and Maintenance Manuals per Section 01 78 23 – Operation and Maintenance Manuals.
- D. Warranty Documentation

1.06 CLOSEOUT PROCEDURES

- A. See Section 01 77 00 – Closeout Procedures

1.07 DELIVERY, STORAGE AND HANDLING

- A. Inspect for damage and replace any damaged device.
- B. Store in a clean, dry space suitable for equipment and protect against damage.
- C. Clean equipment and touch up minor scratches using suitable materials.

1.08 QUALIFICATIONS

- A. Manufacturer shall have local representation and distribution within 400 miles of the project location to provide technical, warranty claim, and installation support for the project.
- B. Manufacturer/vendor must be capable of supplying SPD for project within 30

days of receipt of order for orders of 25 units and less for models submitted in response to this specification.

- C. Manufacturers shall be certified to latest ISO 9001 standard and shall be registered for the design and manufacturing of SPD devices.
- D. Manufacturer shall provide access to a readily available factory engineer for answering questions about this product.
- E. Manufacturer qualifications shall be provided as part of the submittal.
- F. The successful manufacturer/vendor shall assign a technical contact person for SPD application, installation and warranty questions. This contact shall be available to provide a response to a technical question within a maximum of two business days.
- G. All SPDs for this project must be supplied by the same manufacture.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURES

- A. Total Protection Solutions – Contact Power Solutions NW (206) 930-1980.
- B. Intermatic
- C. Square D (Schneider Electric)
- D. Eaton
- E. Or Engineer Approved Equal

2.02 SURGE CURRENT RATINGS

- A. Minimum Single Impulse Ratings with Independent testing per previous NEMA LS1.
- B. For panelboard provide SPD with 120kA per Phase, 60kA per Mode.

2.03 TYPE

- A. External, non-modular SPD required for all applications (not integrated with gear/panels) connected in parallel to switchgear via dedicated circuit breaker.

2.04 LISTINGS: UL1449 3RD EDITION, UL96A & NFPA 780 (OR CURRENT REVISION)

- A. Type 1 & 2: Suitable for applications including direct buss connection with no additional overcurrent protection requirements.
- B. Nominal Discharge Current (In): 20kA for Main Service and 10kA for all other applications (for compliance to NFPA 780, NEC 280 and UL96A Lightning Protection Master Label).
- C. SCCR: 200KA Short Circuit Current Rating with no additional/external overcurrent protection.

2.05 MODES OF PROTECTION - ALL MODES FOR ALL CONFIGURATIONS AND

- A. WYE: Discrete MOV Line to Neutral, Line to Ground, Neutral to Ground
- B. Delta: Discrete MOV Line to Line & Line to Ground

-
- C. Sinewave tracking transient filter protection for all modes on Wye & L-L for Delta.
- 2.06 LOW IMPEDANCE CABLE (LIC):
- A. An LIC must be available from the SPD manufacture that reduces effective lead impedance by 75%, and be used for all SPD installations with lead lengths exceeding 36”.
- 2.07 DURABILITY TESTING
- A. SPD devices shall withstand a minimum of 5,000 hits delivered at a rate of one pulse per minute. Unit shall not fail or suffer let through voltage degradation of more than 7%. Lead length for testing and let through measurements shall be 6”.
- 2.08 COMPONENT LEVEL FUSING
- A. Balanced array MOV based SPD with individual Component Level Fusing (Oxygen Free High Conductivity [OFHC] elements in silica sand) are required for all components.
- 2.09 SPD MUST NOT HAVE, USE OR REQUIRE ANY OF THE FOLLOWING
- A. Board trace fuses, crowbar type gas tube arrestors or SAD devices are not allowed.
- B. Integrated primary overcurrent protection Fuses or Circuit Breakers are not allowed.
- C. SPDs with external over-current protection requirements (UL Type-2 listing only) are not allowed.
- 2.10 SAFETY
- A. SPD must not fail catastrophically when a continuous over-voltage is applied to 6 modes simultaneously (Line-Neutral & Line-Ground * 3 Phases). UL1449 only requires one mode be tested at a time.
- 2.11 MONITORING
- A. Green “Phase Status” LEDs, Red “Service Required” LED, Dry Contacts & Audible Alarm w/silence button are required. SPD must not rely solely on primary overcurrent protection (no CLF), as this will likely open up on SPD failure, thus disabling the alarm (no power, no alarm).
- 2.12 SERVICE CONDITIONS
- A. SPDs shall be rated for continuous operation under the following conditions, unless otherwise indicated:
1. Maximum Continuous Operating Voltage (MCOV) above nominal – Minimum 115%.
 2. Enclosures: Heavy duty, powder coated steel with appropriate NEMA rating for application.
 3. Operating Temperature: 30 to 120 deg F (0 to 50 deg C).
 4. Humidity: 5 to 95 percent, non-condensing.
 5. Altitude: Up to 13,000 feet (4,000 m) above sea level.

6. Noise Level: SPD shall not emit any audible noise unless “in alarm” indicating a “service required” condition.

2.13 DIMENSIONS (MAXIMUM):

- A. SB – 16” H x 13” W x 7” D; Distribution/Branch – 4” W x 4” D x10” H. Compact SPD dimensions are critical for achieving installations with short leads.

2.14 FLUSH COVER PLATE

- A. Manufacture shall provide smoked acrylic cover plates for flush mounting applications.

2.15 MAXIMUM LET THROUGH VOLTAGES (LTV)

- A. Tested w/6” leads & 500MHz Scope from 0 ref per NEMA-LS1

2.16 WARRANTY

- A. Warranty:
 1. SPD Manufacturer’s Warranty: shall provide a product warranty for a period of not less than ten (10) years from date of installation. Warranty shall cover unlimited, complete replacement of SPD devices during the warranty period with no exceptions for lightning, utility accidents etc.

PART 3 - EXECUTION

3.01 PRE-INSTALLATION

- A. Training: Onsite installation training for the contractor must be provided by the SPD supplier.
- B. Review all installation information in manufacturer’s installation manual prior to installing SPD’s

3.02 INSTALLATION

A. GENERAL

1. Verify all voltages before connecting to avoid injury and damage to equipment.
2. The SPD’s shall be installed external to switchboard, distribution and panelboard.
3. Internally mounted SPD’s will not be accepted.
4. Ground resistance shall be 25 ohms or less per NEC Article 250.56
5. Suppressors shall be installed per the manufacturer's installation instructions and the requirements of: the NEC, the local authority having jurisdiction and the Engineer.
6. The Engineer or their appointed representative may perform inspection of the installed suppressors and reserves the right to require corrections to

the installation to comply with manufacturer's installation requirements and project specifications.

7. The SPD supplier must provide on-site installation training for the electrical contractor.
8. All circuit breakers feeding SPDs must have locking safety clips installed to prevent the circuit breaker from inadvertently being turned off.

B. SECONDARY SPDs FOR BRANCH PANELS

1. Install one secondary suppressor at each panelboard.
2. Provide a 30 Amp circuit breaker (with a safety clip to ensure the circuit breaker cannot be inadvertently turned off) in the panel being protected as over-current protection for the wire and as a disconnecting means for the SPD.
 - a. Only UL1449 Type-1 devices are allowed, so by definition of Type-1, the manufacture cannot have any external overcurrent protection requirements. If the SPD manufacture does have external overcurrent protection requirements, that SPD equipment will not be accepted.
3. Conductors between suppressor and point of attachment to the panelboard shall be kept as short and straight as possible. Mount the SPD directly adjacent to the circuit breaker closest to the neutral bus, such that the maximum length of all connecting wiring is kept as short as possible, not exceed 18 inches.
4. Over-length SPD leads (greater than 18") must be twisted together (2 twists/foot) and securely tie-wrapped once per foot to reduce impedance of the leads. Quality compression butt-splice connections are required when extending SPD leads (wire nuts are not acceptable).
5. Grounding: Suppressor's ground lead shall be bonded to the panel enclosure with a small ground lug as close as possible to the SPD mounting point. Conduit between the SPD and the switchboard must provide secure electrical/mechanical connections.

3.03 FIELD QUALITY CONTROL

- A. A factory authorized representative shall inspect and photograph all SPD installations and report findings in writing to the Engineer.

3.04 STARTUP SERVICE

- A. Do not energize or connect panelboards to their sources until SPD's are installed and connected.
- B. Do not perform insulation resistance "Hi-pot" tests of the distribution wiring with the SPDs installed/connected. Disconnect before conducting insulation resistance tests, and reconnect immediately after the testing is over.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY OF WORK

- A. Furnish and install all high voltage shore power receptacles for Pier 3 and Pier 4, as shown on the drawings and specified herein. High voltage power receptacles shall be installed in the following shore power vaults:
 - 1. Pier 3 new shore power vault SSB0
 - 2. Pier 3 existing shore power vaults SSB1, and SSB2
 - 3. Pier 4 existing shore power vaults SSB3, SSB4, and SSB5
- B. Contractor shall note that not all shore power vaults are the same size, and the “tight space” in existing shore power vaults. Each shore power receptacle size shall be based on the existing (SSB1, SSB2, SSB3, SSB4, and SSB5) and new (SSB0) shore power vault dimensions. Contractor shall also make sure that the kirk key and pin of each shore power receptacle shall be easily accessible for operation.

1.02 REFERENCES

- A. American Iron and Steel Institute (AISI)
 - 1. AISI 304 Stainless Steel
 - 2. AISI 316 Stainless Steel
- B. National Electrical Manufacturer’s Association (NEMA)
- C. IEC/IEEE 80005-1: 2019, IEC/ISO/IEEE 2019, Edition 2.0 2019-03 – Utility Connection in Port – Part 1 – High Voltage Shore Connection (HVSC) Systems – General Requirements.

1.03 SUBMITTALS

- A. Submittals during Construction
 - 1. Submit materials data in accordance with of Section 01 33 00 – Submittal Procedures. Furnish manufacturers’ technical literature, standard details, product specifications, and installation instructions.
 - 2. Submittals shall include the following:
 - a. Product Data: For each shore power receptacle as shown on the drawings, include dimensions and manufacturers’ technical data on features, performance, electrical characteristics, ratings, and finishes.
 - b. Shop Drawings:
 - (1) Shore Power Outlet Boxes
 - c. Material lists
 - (1) Shore Power Outlet Boxes
 - d. Installation requirements and recommendations
 - (1) Shore Power Outlet Boxes
 - e. Maintenance Data: For Shore Power Receptacles and components to include in maintenance manuals specified in

Division 1 General Requirements.

- B. Closeout Submittals
 - 1. Final record drawings.
 - 2. Operation and maintenance manuals.
 - 3. Original certified test reports.
 - 4. Refer to Section 01 77 00 – Closeout Procedures.

1.04 QUALITY ASSURANCE

- 1. All equipment and material shall be the latest design, new, un-deteriorated, and the first quality standard product of the manufacturer.
- 2. When two or more units of the same class of equipment are required, they shall be products of a single manufacturer.

1.05 STORAGE

- 1. All equipment shall be stored in a heated and ventilated shelter away from any possible collision damage.
- 2. Equipment shall not be stored in a stacked arrangement.
- 3. Equipment, if not installed, shall be suitably sealed in their original packaging for long term storage and stored in a clean, dry area (heated and ventilated).
- 4. General condition of equipment shall be inspected at regular intervals.

1.06 EXTRA MATERIALS

- A. Spare and extra parts shall be identified for all products, but not provided. Include spare parts information in Operation and Maintenance Manuals.

PART 2 - PRODUCTS

2.01 MEDIUM VOLTAGE SHORE POWER OUTLET BOXES

A. DESCRIPTION

- 1. All components described below or shown in the contract drawings shall be supplied by the shore power outlet box manufacturer as a completely factory assembled package ready for installation by the Contractor. Internal components required are as follow:
 - a. Shore power outlet connection box shall be fabricated in AISI304 stainless steel (powder coated gray) and dimensioned as identified in the project plans and specifications.
 - b. Shore power outlet box shall be 316 Stainless Steel NEMA 4X compliant and rated at 7.2kV / 700A as manufactured by Cavotec, or Engineer Approved Equal.
 - c. Shore power outlet box shall be shipped from the manufacturer's US-based factory as a complete sub-assembly inclusive of the shore power junction box, push pull 7.2kV sockets, and controls junction box/terminal block.
 - d. The shore power outlet box shall include a pair of two (2) 7.2kV

- Push-Pull sockets (Configuration: 3Ph+Ground+3pilots, anodized blue with clear- coat, and anodized red with clear- coat) respectively. The two color-coded connectors shall be compliant with Protection index IP66 and keyed differently so that each will mate only with the respective socket.
- e. The Push-pull socket design shall incorporate a cam device with automatic spring-loaded socket cover. The handle side plates shall be manufactured in bronze (ISO 3522, CuSn5PbZn5) and shall incorporate a stainless-steel hold open feature that secures the handle in an open position during the connection procedure.
 - f. The socket housing shall be aluminum (ISO 3522, AL-Si7MgFe) and all fastening and movable components shall be fabricated in 316 stainless-steel.
 - g. The sockets shall each be rated to a maximum voltage of 7.2kV AC and nominal amperage of 350 Amps. Socket manufacturer shall provide test documentation upon request to confirm compliance with the following requirements.
 - (1) Test Voltage Phase to Ground (according to VDE 0670 and VDE 0432 list 2): 21 kV AC for 1 minute
 - (2) Test Voltage Phase to Phase: 25 kV AC for 1 minute.
 - (3) Test Voltage Phase to Ground Short Circuit withstand capacity: 16kA for 1 second.
 - h. Sockets shall also comply with the following:
 - (1) Contact resistance: 1 milli-ohm
 - (2) Size of phase and ground pins shall be 12mm in diameter
 - (3) Size of pilots shall be 6mm in diameter
 - (4) Phase cable terminals must be compression type and detachable.
 - (5) Pilot cable terminals shall be crimp or solder type.
 - (6) Female contacts shall be fitted with internal slotted contact sleeve and the contact must remain fully effective up to 392 Degrees Fahrenheit.
 - (7) Pins and contacts must be silver plated and built to DIN 57 670 specifications.
 - (8) The insulators shall be thermo plastics material type PPO and must be interchangeable in the plug and socket body shells.
 - i. Mechanical interlocks (keyed per contract requirements) must be Kirk Lock HD model.
 - j. After installation all conduit entries must be completely sealed by the Contractor using expanding foam.
 - k. Manufacturers:

-
- (1) Cavotec
 - (2) Or Engineer Approved Equal
- B. PRODUCT SUPPORT
- 1. Manufacturer shall have a service center office within Washington State, where common spare parts for the equipment shall be available.
 - 2. Manufacturer shall have a dedicated field service team based in Washington State, able to provide maintenance or product training on the equipment.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. All installation shall follow manufacturer recommendation.

3.02 IDENTIFICATION

- A. Provide warning signs that read “DO NOT ENGAGE OR DISENGAGE PLUG AND RECEPTACLES WHILE ENERGIZED.”
- B. Provide nameplate indicating supply voltage, maximum current per outlet, and matching plug identification number on outlet side of enclosure.

3.03 OPERATION AND MAINTENANCE MANUALS

- A. Comply with Section 01 78 23 - Operations and Maintenance Manual.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY OF WORK

- A. The extent and location of General Communications Requirements Work is shown in the Contract Documents. Section includes, but is not limited to, general requirements for communications and electronic installations. The Work includes:
1. Provide and install pathways for fiber optic and unshielded, twisted-pair (UTP) cabling.
 2. Provide testing of communication components and systems to meet warranty requirements. Coordinate with the Engineer for UTP and fiber optic cable testing.
 3. Provide and install labels.
 4. Contractor to provide as-built labeling information to Engineer within three (3) days of project completion.
 5. Coordinate with the Engineer for use of existing cable pathways (underground ducts and vaults) to install portions of the cabling.
 6. Comply with low-voltage grounding specifications in Section 33 79 00 Site Grounding.

1.02 GOVERNING CODES, STANDARDS AND REFERENCES

- A. ANSI/TIA/EIA-568-B, Commercial Building Telecommunications Cabling Standard.
- B. ANSI/TIA-606-A Administration Standard for Commercial Telecommunications Infrastructure
- C. ANSI/TIA-758-A, Customer-Owned Outside Plant Telecommunications Infrastructure Standard.
- D. BICSI (Building Industry Consulting Services International): Comply with the most current editions of the following BICSI manuals:
1. BICSI - Telecommunications Distribution Methods Manual
 2. BICSI Outside Plant Design Reference Manual
 3. BICSI -Electronic Safety and Security Design Reference Manual
- E. Underwriters Laboratories (UL) Cable Certification and Follow-Up Program.
- F. National Electrical Manufacturers Association (NEMA)
- G. American Society for Testing Materials (ASTM)
- H. National Electrical Code (NEC) with applicable edition year
- I. National Electrical Safety Code (NESC) with applicable edition year
- J. IEC 60793-2-10
- K. IEC/IEEE 80005-1 Edition 2.0 2019-03
- L. IEC/IEEE 80005-2 2016

- M. Institute of Electrical and Electronic Engineers (IEEE)
- N. UL Testing Bulletin
- O. ETL Testing Laboratories
- P. Federal Communications Commission (FCC)
- Q. Washington State Department of Labor and Industries

1.03 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of the Contract and Division 1 Specification Sections:
 - 1. Product Data: For each type of product indicated.

1.04 DEFINITIONS FOR INFRASTRUCTURE

- A. The following cables shall be utilized for cable infrastructure
 - 1. Shielded Twisted Pair (STP) Water Blocked Category 5 (Cat 5) minimum.
 - a. Terminations shall match the cable used.
 - 2. The following Fiber Optic (FO) cables shall be utilized for shore power connections. Minimum fiber to be installed is 12 strands, fully terminated.
 - a. Terminate MMF first in any Fiber Optic Patch Panel (FOPP)
 - b. Fiber optic cables
 - (1) Terminate Source (switchgear, shore power receptacles, and vessels).
 - (2) As required, utilize necessary Fiber optic cables, patch panels, splice shelves, adapters, connectors, buffer kits, breakout kits, consumables, and accessories.

1.05 EQUIPMENT CERTIFICATION

- A. Listed Equipment: All applicable material, including accessories to the system and including all wire and cable, shall be listed by an approved agency recognized by Washington State Department of Labor and Industries for the use intended i.e., UL, ETL, etc.
- B. Applicable standards compliance: In addition to the L&I approved listing agency, all communication equipment shall meet applicable portions of FCC, TIA/EIA, ANSI, standards for product performance and quality.

1.06 WARRANTY

- A. See Division 1 Closeout Procedures.

1.07 RECORD DOCUMENTS

- A. Record documents: Prepare record documents in which indicate the following installed conditions:
 - 1. Communication pathways, size and location, for both exterior and interior; and locations of patch panels, and equipment.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY OF WORK

- A. The extent and location of Communication Pathways Work is shown in the Contract Documents. The Contractor shall furnish and install cable pathways as shown in the Drawings and specified herein. Pathways shall include, but not be limited to, PVC and metallic conduit, fabric innerduct, and underground manholes/vaults and handholes.

1.02 GOVERNING CODES, STANDARDS AND REFERENCES

- A. American National Standards Institute (ANSI)
- B. American Society for Testing and Materials (ASTM) A123 - Specification for Zinc (Hot Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars, and Strip.
- C. National Electrical Code (NEC)
- D. National Fire Protection Agency (NFPA) 70
- E. Underwriters Laboratory (UL)
- F. UL 910 Test for Flame-Propagation and Smoke Density
- G. UL 2024 Standard for Cable Routing Assemblies and Communications Raceways
- H. Washington State Labor and Industry
- I. American National Standards Institute (ANSI)/National Fire Protection Agency (NFPA) 70 - National Electrical Code (NEC).

1.03 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of the Contract and Division 1 Specification Sections:
 - 1. Product Data: For each type of product indicated.

1.04 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in manufacture of cables as required, whose products have been in satisfactory use in similar service for not less than 5 years.
- B. NEC Compliance: Comply with NEC, as applicable to construction and installation of conduit, and innerduct systems.
- C. Listing Compliance: Provide products that are UL labeled or Washington State Labor and Industry recognized.

1.05 DRAWINGS

- A. The Drawings indicate the general route of the underground ducts and conduits. Data presented on the Drawings are as accurate as preliminary surveys and planning can determine. Accuracy is not guaranteed and field verification of all dimensions and routing is required.

- B. Specifications and Drawings are for assistance and guidance, but exact routing, locations, distances, and levels will be governed by actual field conditions. The Contractor shall make field surveys as part of his Work. Deviations from indicated routes, additional bends, and vertical transitions shall be submitted to the Engineer for approval prior to installing underground ducts or conduits.

PART 2 - PRODUCTS

2.01 CONDUIT REQUIREMENTS

- A. Refer to Specification Sections 26 05 33 Raceways and Boxes for Electrical Systems and 33 71 19 Electrical Underground Ducts and Manholes .
- B. Refer to Innerduct in Sec. 2.02 for proper fill of conduits.
- C. For all metal conduits the Contractor shall provide threaded plastic bushings and pull cords.
- D. Routing of any metallic media cabling such as voice, data or coaxial in the same conduit as power conductors is not allowed.

2.02 INNERDUCT

- A. Acceptable manufacturers:
 - 1. Pyramid
 - 2. Carlon
 - 3. MaxCell
 - 4. Or Approved Equal.
- B. Flexible fabric innerduct for use in new conduits or ducts, and in existing ducts.
 - 1. Color: Use three unique colors, use one color per 3-pack (color shall be in stitched spine or on fabric material)
 - 2. Use product in 2 and larger conduit runs.
 - 3. Pull Tape: Provide tape per fabric innerduct.
 - 4. UL: UL 910 and/or 2024 list with tags or marking and for cables listed under ANSI/UL-1666 (1997) or Washington State Labor and Industries recognized.
 - 5. National Electrical Code (NEC) Compliance: Comply with NEC as applicable.

2.03 PULL CORD

- A. The Contractor shall provide and install a pull cord and true tape from end to end in every conduit, and innerduct.
 - 1. The pull cord shall be new polypropylene over polyester rope with a minimum 1700 lb. tensile strength.
 - 2. The Contractor shall leave at least 18 inches of pull cord accessible at both ends of the conduit or innerduct.
 - 3. The pull cord shall be continuous with no knots or splices for the length installed.

2.04 GROUNDING SYSTEM AND CONDUCTORS

- A. Bonding and grounding shall meet the requirements specified in Section 33 79 00 Site Grounding.

2.05 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

PART 3 - EXECUTION

3.01 COMMON REQUIREMENTS FOR COMMUNICATIONS INSTALLATION

- A. Installation shall meet or exceed all applicable federal, state and local requirements, referenced standards and conform to codes and ordinances of authorities having jurisdiction.
- B. All installation shall be in accordance with manufacturer s published recommendations.
- C. Install to facilitate service, maintenance, and repair or replacement of components of both communications equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.

3.02 SEPARATION FROM EMI SOURCES

- A. Comply with TIA/EIA-569-A recommendations for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.
- B. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:
 - 1. Electrical Equipment Rating Less Than 2 kVA: A minimum of 5 inches.
 - 2. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches.
 - 3. Electrical Equipment Rating More Than 5 kVA: A minimum of 24 inches.
- C. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:
 - 1. Electrical Equipment Rating Less Than 2 kVA: A minimum of 2-1/2 inches.
 - 2. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches.
 - 3. Electrical Equipment Rating More Than 5 kVA: A minimum of 12 inches.
- D. Separation between communications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:
 - 1. Electrical Equipment Rating Less Than 2 kVA: No requirement.

2. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 3 inches.
 3. Electrical Equipment Rating More Than 5 kVA: A minimum of 6 inches.
- E. Separation between Communications Cables and Electrical Motors and Transformers, 5 kVA or higher: A minimum of 48 inches.

3.03 SUPPORTS AND BRACING

- A. Provide supports at each connection point, at the end of each run, and at other points to maintain spacing between supports as required by the NEC.
- B. Install in accordance with applicable codes and regulations.
- C. Do not use nylon or plastic tie wraps, wood or plastic expansion inserts or adhesives as principal or secondary support means.

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 33 Raceways and Boxes for Electrical Systems
 - 3. Section 26 05 53 Identification for Electrical System
 - 4. Section 27 05 13 General Communications Requirements
 - 5. Section 27 05 28 Communications Pathways
 - 6. Section 33 71 19 Electrical Underground Ducts and Manholes
 - 7. Section 33 79 00 Site Grounding

1.02 SUMMARY

- A. Summary of Work: The Work of this section includes the construction, test, documentation, and warranty of a fiber optic cable and unshielded, twisted-pair (UTP) copper backbone cable in accordance with the specifications and Drawings.
- B. This Work specified in this section includes installation of backbone cabling. For this Work, the Contractor shall:
 - 1. Provide optical fiber backbone cable and associated accessories.
 - 2. Provide UTP backbone cable and associated accessories.
 - 3. Conduct testing.

1.03 SCOPE OF WORK

- A. The Contractor shall provide materials and labor required to deliver a complete backbone cable system as indicated on the Contract Drawings, schedules, and these Specifications.
- B. This Work shall include, but may not be limited to, the following tasks:
 - 1. The Contractor shall provide backbone optical fiber cable that is pre-installation tested, correctly installed and terminated, and Contractor-tested.
 - 2. The Contractor shall provide backbone copper cable that is correctly installed and terminated, and Contractor-tested.
 - 3. The Contractor shall provide patch panels, termination blocks and end point termination devices to enable the termination and identification of the backbone cable system.
 - 4. The Contractor shall provide and install cable devices and accessories, such as patch panels, in racks provided by the Contractor.
- C. Label devices, cables, and ports per Section 26 05 53 - Identification for Electrical System.
 - 1. Conduct testing on backbone cabling.

1.04 REFERENCES

- A. American National Standards Institute (ANSI):

-
- B. Telecommunications Industry Association/Electronics Industries Alliance (TIA/EIA):
 - 1. EIA-440-A (Current Edition): Optic Fiber Terminology
 - 2. TIA/EIA 455-B, Standard Test Procedure for Fiber Optic Fibers, Cables, Transducers, Sensors, Connecting and Terminating Devices and other Fiber Optic Components
 - 3. FOTP-78 (TIA/EIA-455-78A) (Current Edition): Fiber Optic Test Procedure 78 - Spectral Attenuation Cutback Measurement for Single-Mode Optical Fibers
 - 4. TIA/EIA 455-B (Current Edition): Standard Test Procedures for Fiber Optic Cable Fibers, Cables, Transducers, Connecting and Terminating Devices
 - 5. TIA/EIA-526 (Current Edition): Standard Test Procedures for Fiber Optic Systems
 - 6. TIA/EIA-568-B (Current Edition): Commercial Building Telecommunications Cabling Standard, with addenda
 - 7. ANSI/TIA-569-B Commercial Building Standard for Telecommunications Pathways and Spaces
 - C. National Fire Protection Association (NFPA):
 - 1. NFPA 70 National Electrical Code (NEC)

1.05 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of the Contract and Division 1 Specification Sections:
 - 1. Product Data: For each type of product indicated.
 - 2. Documentation that termination crafts-people are properly trained for optical fiber termination and testing. Documentation shall be from a technical school, manufacturer s school, or labor union training.
 - 3. Discrepancy report describing existing equipment, and rack conditions that would affect the ability of the Contractor to successfully complete the Work.
 - 4. Warranty documentation on products.
- B. The Contractor shall provide the following technical submittals:
 - 1. Manufacturer s complete product data and specifications, with drawings as applicable for materials furnished by the Contractor.
 - 2. Backbone Cable Test Plan as described in Article 3.12.
 - 3. Backbone cable testing results in hard and soft copy formats.
 - 4. Results of pre-installation optical fiber reel tests for Engineer review and approval.
 - 5. Conduit fill plan indicating initial cable fill percentages and the use of innerduct.
 - 6. Single-line schematic diagrams showing final equipment placements, cable groups, and termination details.
 - 7. Cable Pulling Plan: The Contractor shall submit a cable pulling plan, as follows:
 - a. Indicate the installed backbone conduit layout in schematic format, including vaults and distances between vaults.

- b. Indicate contents of each conduit.
 - c. Indicate the cable pulling calculations, conduit fill ratios and actual cable runs and tensions.
 - d. Installation of cabling shall not commence prior to approval of the pulling plan and calculations by the Engineer.
8. Contractor s test plan for the required optical fiber and metallic (copper) cable tests.
9. Final as-built backbone wiring drawings and documentation.
- C. Contractor to provide as-built labeling information to Engineer within three (3) days of project completion.

1.06 PROJECT CONDITIONS

- A. Verification: Obtain specific cable lengths and location of racks and equipment by field measurement after contract award. Do not vary from the routes indicated in the drawings without prior approval from the Engineer.

1.07 QUALITY ASSURANCE

- A. Contractor Qualifications:
- 1. Manufacturer shall have a certified installer program; installers shall have valid certification from specific Manufacturer.
- B. Standards:
- 1. Provide system components that are Underwriters Laboratories (UL) listed and labeled when applicable.
 - 2. Electronics Industry Association (EIA)-455-B Standard Test Procedures for Fiber optic Fibers, Cables, Transducers, Connecting and Terminating Devices.
 - 3. ANSI/TIA/EIA-568-B Commercial Building Communications Cabling Standard, including addenda.
 - 4. ANSI/TIA/EIA-598-A Optical Fiber Cable Color Coding.
 - 5. TIA/EIA TSB-67 Transmission Performance Specifications for Field Testing of Unshielded Twisted-Pair Cabling Systems.
- C. Codes and Regulations:
- 1. National Electrical Code (NEC) Compliance: Comply with NEC as applicable.
 - 2. Local Codes: Comply with state and local codes as applicable.
- D. Manufacturer s Recommendations: Install items per manufacturer s recommendations. Recommendations shall include, but not be limited to, cable handling, bending, and pulling requirements or limits; termination methods and materials; and use of specific tools and disposables.
- E. Tests: Perform tests as specified in Part 3 Execution of this section.

1.08 DELIVERY, HANDLING, AND STORAGE

- A. Materials shall be delivered in original packages with labels intact and identification clearly marked.

- B. Storage temperature range: -40 F to 149 F (-40 C to 65 C).
- C. Protect equipment and materials from foreign objects such as dirt, dust, paint, liquids, construction debris, and other contaminants. Protect from weather, humidity, temperature, and sunlight. Protect from physical damage.
- D. Keep dust caps in place on patch panels and replace after testing. Protect 66 blocks with masking until construction is complete.
- E. Equipment damaged prior to system acceptance shall be replaced with new at no additional cost to the Port.

1.09 WARRANTY

- A. General: Refer to Division 1 General Requirements for general warranty requirements.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Backbone cabling infrastructure shall be Corning Altos loose tube, gel-free cable, single mode, or Engineer approved equal. Connectors shall be Corning FuseLite Splice-On Type LC connectors, or Engineer approved equal.
- B. Products and materials shall be new and fit the intended purpose.
- C. Damaged or defective products and components shall be replaced by the Contractor at no additional cost to the Port.
- D. Cabling and termination hardware damaged prior to system acceptance shall be replaced by the Contractor at no additional cost to the Port.
- E. Miscellaneous materials required for a complete and operational cabling system shall be provided by the Contractor.

PART 3 - EXECUTION

3.01 PRE-INSTALLATION TESTING

- A. General: The Contractor shall perform pre-installation tests on all fiber optic cables prior to installations. The Contractor shall accept only materials that pass the test.
- B. Testing:
 - 1. General: Test data shall include cable reel serial number and cable product number for identification. Report defective cables immediately to the Engineer. Repeat pre-installation tests if necessary when cable reels are stored unprotected on the job site or are mishandled. Do not install defective cables.
 - 2. Records: Cable reel serial number and cable product number shall be recorded and included in the test results for each reel. Printouts of the traces and test parameters shall be submitted to the Engineer within 5 working days of completing the test.
 - 3. Tests: The Contractor shall perform tests on 100% of fiber strands with an optical time-domain reflectometer (OTDR) at 1310 nanometers and 1550 nanometers for singlemode fibers. The OTDR shall have a loss resolution of 0.01 dB or less, and a distance resolution of one (1) foot or less. Submit images of the OTDR traces for review and approval.
 - 4. Test Criteria: A cable shall pass the test only if all strands have an attenuation no greater than the maximum attenuation stated in the manufacturer's published specifications, and if

no strands have point discontinuities greater than 0.1 dB maximum for singlemode (1310 nm and 1550 nm windows).

3.02 SCHEDULING AND COORDINATION

- A. Scheduling of Work shall be coordinated with the Engineer and tenant representatives to minimize impact on operations and the traveling public.
- B. Scheduling of cable installation shall be coordinated with other trades within the Contract.

3.03 SURVEY AND PREPARATION

- A. The Contractor shall survey existing underground ducts, conduit paths and routes, and report discrepancies and issues with the use of these for cable installation. Failure to perform this inspection and submit the report holds the Contractor at cost risk for corrective actions and schedule impacts later in the Work.
- B. Contractor shall be responsible for storage of all materials until installation.

3.04 INSTALLATION OF PULL STRINGS

- A. The Contractor shall install pull strings and true tape with cable installation in existing or new conduits, underground ducts, and inner duct.
- B. Pull strings shall be left in place.
- C. In existing conduits or underground ducts with existing pull strings, the Contractor shall replace used pull strings with new pull strings.
- D. Pull strings are not required where conduit or innerduct fill is greater than 33% after installation of cable.

3.05 INSTALLATION OF PATCH PANEL AND ASSOCIATED DEVICES

- A. The Contractor shall inspect patch panels, associated devices, and materials for compliance with these Specifications and with the Contractor's orders.
- B. Patch panels and associated devices shall be installed according to manufacturer's instructions.
- C. Patch panels and termination hardware shall be installed with matching mounting screws at each location.

3.06 GENERAL CABLE INSTALLATION

- A. The system shall be installed to comply with all applicable standards, codes, and regulations. In general, where the specifications, drawings, standards, regulations, and codes conflict, the most stringent requirement shall apply; however, the Contractor shall notify the Engineer immediately of conflicts for determination of a resolution.
- B. Cables shall be installed in innerducts that are installed in conduits and underground ducts, as shown on the Drawings.
 - 1. Refer to Section 27 05 28 Communication Pathways, PART 2 section: 2.02 for approved innerduct
- C. Backbone fiber and copper cable shall be installed with no splices.
- D. The Contractor shall protect cables from dirt and moisture by laying cables on a clean, new ground covering.

-
- E. The Contractor shall inspect and clean as necessary existing and new underground ducts and conduits to ensure that they are clean and free of obstructions prior to installing pull strings or pulling cable.
- F. The Contractor shall not install damaged or defective cables or components. The Contractor shall carefully inspect cable jacket for defects as cable is pulled off the reel.
- G. Cable Pulling:
1. Pull cable in accordance with manufacturer s recommendations and industry-accepted practices, and within the limits of cable bend radius and pulling tension specifications.
 2. Use of pulling lubricants to be compatible with the cable and per manufacturer s recommendations. Petroleum products shall not be used as cable pulling lubricant.
 3. Cables shall be hand pulled when possible or when required by manufacture. The Contractor shall use a recording tensiometer on pulls that may exceed 100 pounds pulling tension and always when a winch is used for pulling. Tensiometer printouts shall be identified by cable and submitted to the Engineer for each pull requiring use of a tensiometer.
 4. Pulling fixtures shall be attached to cable strength members. If indirect attachments are used, the grip diameter and length shall be matched to the cable diameter and characteristics, and the pulling forces shall be reduced to ensure that the fibers or copper pairs are not damaged from forces being transmitted to the strength member.
 5. Cable installation methods shall not exceed the cable manufacturer s specified pull tension for the specific cable.
 6. The mechanical stress placed upon a cable during installation shall be such that the cable is not twisted or stretched, nor shall the process kink or crush the cable.
 7. A cable feeder guide shall be used between the cable reel and the face of the underground duct or conduit to protect the cable and guide it into the underground duct or conduit as it is played off the reel.
 8. The Contractor shall follow the manufacturer s installation instructions and its specifications for minimum bend radius; the bend radius shall not exceed the manufacturer s minimum bend radius
 9. Cable fill shall not exceed NEC standard.
- H. Communication room entry
1. Optical fiber cable shall be routed from the conduit entry point in communication rooms without innerduct (when transitioning into room from installed in conduit), but in combed and tied bundles to the termination locations. Service loops of at least 5 meters in length.
 2. Copper cable shall be routed from the conduit entry point in communication rooms without innerduct, but in combed and tied bundles to the termination locations. Service loops of at least 5 meters in length.
- I. Backbone Service loops of at least 5 meters in length shall be provided at both ends of each cable and at every Manhole in OSP applications.
- J. Cable shall not be twisted, kinked, crushed, stretched, split, scarred, or otherwise damaged. Inspect cable jacket carefully for defects as cable is played off the reel. Protect cable from contaminants and physical damage at all times.

- K. All strands of fiber optic cables shall be terminated to patch panels unless indicated otherwise in the drawings. All pairs of UTP copper cables shall be terminated to patch panels or 66 blocks.
- L. Fiber optic cable and UTP copper cables shall be 100% usable after installation, termination, and testing. Replace defective or damaged cables and terminations with new at no additional cost to the Port. Repair splicing of damaged cables is not permitted.
- M. Cable Preparation and Breakout: Cables shall be dressed and routed at termination points. Cables shall be combed and each strand shall run parallel with the other strands. After combing and straightening strands, Contractor shall separate strands into bundles according to routing requirements and termination points. Bundles shall be secured with hook-and-loop cable strap material specified in Part 2 Products of this section. Cable ties of hard polymer material shall not be used.
- N. Splices and Intermediate Terminations: Cables shall be run continuous between termination points shown on the drawings and shall NOT be spliced. Intermediate terminations or splices for the convenience of pulling or to repair a damaged or defective cable shall not be made.
- O. Routing of any metallic media cabling such as voice, data or coaxial in the same conduit as power conductors is not allowed.

3.07 CABLE TERMINATION

- A. Optical fiber cable termination
 - 1. Optical fiber terminations shall be made by personnel trained and certified by the manufacturer of the fiber and connectors and shall be installed using the appropriate tool kit and equipment approved by manufacture.
 - 2. Optical fiber shall be terminated in LC connectors.
 - 3. Optical fiber connectors shall not exceed manufacturer s acceptable loss budget.
- B. Category 5 and/or 6/6a cable termination
 - 1. Terminated cables shall meet the required performance with no degradation due to termination.
 - 2. Category 5 and/or 6/6a cables 12 pair cable shall be terminated 66-block units in T568B configuration.

3.08 SEISMIC JOINT PENETRATIONS

- A. When conduit or pathway penetrates a building expansion joint, the Contractor shall furnish and install a seismic coupling.

3.09 FIELD QUALITY ASSURANCE

- A. The Contractor shall perform inspections per Section 27 05 13 - General Communications Requirements.
- B. The Contractor shall perform horizontal cable testing as part of the field quality assurance for this Work.
- C. The Engineer may arrange for interim inspections by a manufacturer s representative as conditions deem necessary.

3.10 SYSTEM PERFORMANCE

- A. Fiber Optic Cable and Terminations: The maximum attenuation of each fiber strand, not including terminations, shall be no greater than the manufacturer s specified maximum attenuation for the cable. The maximum attenuation of a mated pair of connectors shall be no greater than the manufacturer s specified average attenuation of a mated pair of connectors plus 0.3 dB. The maximum attenuation of a fiber strand, terminated at both ends, shall be no greater than the actual measured attenuation of the fiber strand plus the manufacturer specified average attenuation of the mated connectors plus 0.5 dB. The average attenuation of all connectors on a fully terminated cable shall be no greater than the manufacturer s specified average attenuation of the mated connectors.
- B. UTP Copper Cable and Terminations: The UTP copper system, including cables and terminations, shall meet the requirements of TIA-568-B, including all applicable addenda and service bulletins.

3.11 GENERAL REQUIREMENTS FOR BACKBONE CABLING TESTING

- A. The Contractor shall provide all personnel, equipment, instrumentation, and supplies necessary to perform specified testing.
- B. Prior to testing the cable, the Contractor shall verify that the components and systems being tested have been installed in accordance with the Contract Documents.
- C. Cable testing shall be completed by the Contractor and accepted by the Engineer as a condition of Substantial Completion.

3.12 BACKBONE CABLE TEST PLAN

- A. The Contractor shall submit a general backbone cable test plan to the Engineer for review and approval 20 working days prior to the start of on-site cable installation Work, and 20 working days prior to pre-installation optical fiber reel testing.
- B. The test plan shall include:
 - 1. Schedules for the following:
 - a. Optical fiber pre-installation reel testing by the Contractor
 - b. Optical fiber terminated cable testing by the Contractor
 - c. Copper cable terminated cable testing by the Contractor
 - 2. The test plan shall include a list of the test equipment to be used by the Contractor, including model number of sample test reports and wave forms, manufacturer training certificates for technicians operating test equipment and calibration certificates, for approval by the Engineer prior to the start of testing. Test equipment shall have the latest firmware upgrades installed prior to testing. Port-specified test equipment shall be as follows:
 - a. Optical Time Domain Reflectometer (OTDR). The Contractor shall submit the OTDR model number and calibration certificates to Engineer for approval prior to testing.
 - b. Optical Fiber Power Meter. The Contractor shall submit the Power Meter model number and calibration certificates to Engineer for approval prior to testing.

- c. Unshielded twisted pair (UTP) cable tester. The Contractor shall submit UTP cable tester model number and calibration certificates to Engineer for approval prior to testing.
3. Summary of the tests that are to be performed by the Contractor, and the test results that are to be submitted.

C. Backbone cable test results - submittals

1. The Contractor shall provide test results in hard copy and soft copy format. The format, content, and graphic scales shall be submitted to the Engineer for approval prior to performing tests.
2. Contractor shall furnish to the Engineer the licensed software required to view electronic copies of test results.
3. Final testing shall use cable naming as indicated in the drawings, in all test records.

3.13 OPTICAL FIBER PRE-INSTALLATION REEL TESTING

- A. The Contractor shall compare factory test data with data obtained by conducting a pre-installation reel test as follows.
- B. Dual-pulse Function A fiber shall be tested at a single wavelength with two pulse widths.
- C. Two traces shall be displayed, one for each pulse width. (The short pulse provides optimal event resolution, while the longer pulse provides excellent distant measurements.)

3.14 OPTICAL FIBER TERMINATED CABLE

- A. The Contractor shall test fiber with launch and receive cables in both ways and record measurements for the following:
 1. Link loss. The one-way backbone link loss shall be less than 2.0 dB, measured at either 850nm or 1300nm.
 2. Fiber attenuation (dB/km)
 3. Splice and connector loss
 4. Reflectance and optical return loss
 5. Length
- B. Optical fiber cable shall comply with the following singlemode standards:
 1. ANSI 2136.2
 2. EIA-440-A
 3. Fiber optic test procedure (FOTP) FOTP-8 (TIA/EIA-455-8)
 4. FOTP-61 (TIA/EIA-455-61-A)
 5. FOTP-77 (TIA/EIA-455-77)
 6. FOTP-78 (TIA/EIA-455-78A)
 7. FOTP-95 (TIA/EIA-455-95)
 8. FOTP-171 (TIA/EIA-455-171)
 9. TIA/EIA-455-B

10. TIA/EIA-526

3.15 CATEGORY 5 AND/OR 6/6a TERMINATED CABLE TESTING

A. The Contractor shall test and record measurements for the following:

1. TIA Category 6/6a per TIA addendum #1 to TIA/EIA-568B
2. IEEE 802.3 1000 Base-T

3.16 LABELING AND COLOR CODES

A. Identification and labeling, shall comply with Section 26 05 53 - Identification for Electrical Systems.

END OF SECTION

PART 1 – GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

- A. The provisions and intent of the Contract, including the General Conditions and General Requirements, apply to this work as if specified in this section. Work related to this section is described in:
 - 1. Section 31 23 33 - Trenching and Backfilling

1.02 DESCRIPTION OF WORK

- A. The work includes excavation, subgrade preparation, backfilling, 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 or may be blended with additional aggregates to meet the grading requirements for Fill or Backfill. Use of on-site material as Fill or Backfill is subject to approval by the Engineer as described in these Specifications. Physical and/or chemical characterization of excess materials may be required and will be provided by the Port as determined by the Engineer.
- C. Soils that cannot be reused onsite and are anticipated to be exported to an off-site facility must have a completed soil profile prior to export. The Port will conduct testing of material as defined further in Section 01 74 16 – Soil Characteristics and Waste Management. The Contractor is responsible for any additional testing necessary to satisfy requirements of the Contractor's receiving facility.

1.03 QUALITY ASSURANCE

The Port will provide testing and inspection services to the satisfaction of the Engineer unless otherwise specified. Sampling and testing for compliance with the Contract provisions will be in accordance with Section 01 45 00 of these Specifications. The Contractor 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.

1.04 SUBMITTALS

The Contractor shall perform and pay for and submit gradation and test reports for all imported materials as specified in Paragraphs 2.06 and 2.07. Submit test reports for all field tests to determine in-place density as specified in Paragraph 3.05 B.

1.05 SITE CONDITIONS

- A. The Port has subsurface investigations made throughout the project site. The Contractor should anticipate encountering groundwater on the project site. Groundwater has generally been identified between elevations 5 and 11 MLLW. For the design of any permanent structures the Contractor shall assume a groundwater

elevation of +12 MLLW. The information is available for review as described in Section 00 31 00 - Available Project Information.

- B. Existing Utilities: The Contractor shall verify the location of existing utilities at the site as described in Section 02 41 00 - Demolition. Those utilities which are to remain shall be protected from damage. Damage to utilities which are to remain shall be repaired by the Contractor at no cost to the Port.
- C. Contractor may encounter regulated materials within the footprint of the Slip 1 Nearshore Confined Disposal (NCD) facility at varying depths below the primary containment cap, see drawings for anticipated cap elevations. Refer to Section 00 31 26 Existing Hazardous Material Information.
 - 1. Due to the relatively shallow depth of typical trenching activities, and the design depth of the primary containment cap according to the reference drawings, exposure of the capped contaminated materials is not expected for those and similar-depth activities.
 - 2. Contractor may encounter contaminated materials when excavating for vault installation within the footprint of the Slip 1 NCD facility at varying depths below the primary containment cap.

PART 2 – PRODUCTS

2.01 FILL AND BACKFILL

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.

Material used for backfill shall be one of the following:

- A. Material from trench excavation or other on-site borrow soils generated during construction at the site, as approved by the Engineer in accordance with Paragraph 2.07, 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.

2.02 GRAVEL BORROW

Gravel Borrow shall meet the requirements of 9-03.14(1) of the WSDOT Standard Specifications. Imported gravel base shall be characterized as specified in Paragraphs 2.05 and 2.07 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:

Sieve Size	Percent Passing
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 Paragraphs 2.05 and 2.07 at the Contractor's expense.

2.04 QUARRY SPALLS

A. Quarry spalls, if needed, shall meet the following gradation:

Sieve Size	Percent Passing
8"	100
3"	40 Max.
3/4"	10 Max.

Quarry spalls shall be characterized as specified in Paragraphs 2.05 and 2.07 at the Contractor's expense.

2.05 OFF-SITE BORROW SOURCE CHARACTERIZATION

A. General

- i. 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 on-site placement. The characterization will include source identification, analysis 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.

B. Off-site borrow source characterization shall be performed by the Contractor as specified in Paragraph 2.08 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.

- i. Each source of off-site borrow material shall be tested once per year for physical properties.
- ii. Each source of off-site borrow for sands and gravels shall be tested once per calendar year for metals.
- iii. 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.
- iv. 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.

C. Source Identification

- i. 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.

D. Inspection of Source

- i. 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.

E. Testing, Reporting, and Certification

- i. Off-site borrow materials shall be in accordance with the requirements of Paragraph 2.08 unless waived by the Engineer.

F. Inspection of Materials at the Jobsite

- i. 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 Paragraph 2.08 at the Engineer's discretion. Material may be rejected due to the presence of deleterious substances or as a result of substandard test results.

2.06 ON-SITE BORROW SOURCE CHARACTERIZATION

Excess soils generated during site activities may be used as on-site common borrow for backfill and other fill associated with the work, as approved by the Engineer. Characterization of excess materials generated during site activities and proposed for reuse as on-site common borrow material will be performed by the Port of Tacoma as determined by the Engineer to assure that on-site borrow materials are free of contaminants, including debris and meet the requirements of the Contract Documents. The Engineer maintains the right to reject any materials that have been determined to be substandard for any reason. One or more of the physical property tests listed in Table "31 00 00 1 – Import Screening Material Criteria" of these Specifications will be required by the Engineer for characterization prior to acceptance. The Contractor shall provide representative sample(s) of the material if requested.

A. General

Materials shall be of the quality, size, shape, gradation, or equal to that manufacture as specified herein or as approved by the Engineer. The Contractor shall submit a written request for approval for use of on-site common borrow materials at least 1 week prior to any on-site placement. The request shall identify the source of the material, proposed on-site use and quantity of material to be used. The Engineer may request that the Contractor provide samples of the material for physical and/or chemical characterization. The material shall not be reused at the site until approved by the Engineer. Once approved for site use, the Contractor shall perform an on-site inspection of the material to verify that it is the material sampled for characterization and approval.

B. Inspection of Source

The Contractor shall visually inspect excess materials generated from on-site construction proposed to be reused. 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 items listed in Table "31 00 00 1 – Import Screening Material Criteria" at the Engineer's discretion. Material may be rejected due to the presence of deleterious substances or as a result of substandard test results.

2.07 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, as shown in Table 1 below.

- B. The Contractor shall provide test sample(s) of excess materials to be reused and/or exported. The sample data shall be provided at least one week before proposed use or 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	-	0.03
Ethylbenzene	-	6.0
Toluene	-	7.0
Xylenes	-	9.0
Tetrachloroethylene (PCE)	-	0.05
Semi-Volatile Organic Compounds (EPA Method 8270)		
acenaphthene		99.8
anthracene		2,284
benzo[a]anthracene		0.9
benzo[a]pyrene		0.1
benzo[b]fluoranthene		1.4
benzo[k]fluoranthene		13.7
benzoic acid	-	385
benzyl alcohol	-	8,000
bis(2-ethylhexyl)	-	13.9
phthalate	-	12.9
butyl benzyl phthalate	-	95.5
cresol;o-	-	3.1
cresol;p-	-	8,000
dibenzo[a,h]anthracene	-	0.1
dibenzofuran	-	80
di-butyl phthalate	-	59.7
dichlorobenzene;1,2-	-	9.9
dichlorobenzene;1,4-	-	0.2
diethyl phthalate	-	97.8
dimethylphenol;2,4-	-	1.6
di-n-octyl phthalate	-	800
fluoranthene	-	632
fluorene	-	102
hexachlorobenzene	-	0.09
hexachlorobutadiene	-	0.6
indeno[1,2,3-cd]pyrene	-	1.4
methyl naphthalene;2-	-	320

naphthalene	-	5.0
nitrosodiphenylamine;N-	-	0.6
pentachlorophenol	-	0.004
phenol	-	15.8
pyrene	-	656
trichlorobenzene;1,2,4-	-	0.06
Pesticides / PCBs (EPA Method 8081/8082)		
ddd	-	0.3
dde	-	0.4
ddt	-	3.0
Polychlorinated biphenyls (PCBs)	-	1.0
Metals (EPA Method 6010/6020/7041)		
Arsenic	13.8	13.8
Cadmium	2.0	2.0
Chromium (total)	2,000	2,000
Chromium (VI)	-	19
Copper	143	143
Lead	250	250
Mercury	2.0	2.0
Nickel	418	418
Zinc	5,981	5,981

PART 3 – EXECUTION

Excavating and grading which is part of this Contract, 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.

3.01 EXCAVATION AND GRADING

- A. Excavation: Shall be the naturally occurring earth, sand, gravel, or mixtures of the above, required to be moved for the construction of electrical equipment, utility trenches and associated appurtenances. Excavation material shall be moved with the use of mechanical equipment, such as shovels, backhoes, excavators etc., but shall not require drilling and blasting or drilling and line breaking.

Structure excavation for foundations shall be computed using a horizontal limit of 1 foot 0 inches outside and parallel to the neat lines of the footing as shown in the

Drawings. The upper limit shall be the ground surface as it exists at the time the excavation is started.

3.02 EXCAVATION FOR STRUCTURES AND TRENCHING FOR UTILITIES

- A. Excavate as necessary structures to lines and grades indicated on the Drawings.
- B. Brace and shore sides of excavations as necessary. Comply with all federal, state, and local regulations regarding shoring, bracing, and other protection requirements.
- C. 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.
- D. Protect excavated material, stockpiled for use as backfill from contamination by other materials and from damage due to weather by covering with waterproof sheeting or other suitable means.
- E. Unsuitable material excavated shall be replaced with Gravel Backfill for Drains per Paragraph 2.04 as directed by the Engineer. See Section 01 35 43.13 – Hazardous Materials Handling Procedures for information on unsuitable material identification and disposal.
- F. 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. No soil shall be removed from the site without a completed soil profile and prior notification to the Engineer. Refer to Section 01 74 16 – Soil Characteristics and Waste Management for additional requirements.

3.03 FILL AND BACKFILL FOR STRUCTURES AND UTILITIES

- A. All underground structures including vaults, 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 shall be placed and compacted.
- B. Place backfill and structural backfill to line and grade 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 3.04, 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. Place fill in layers not exceeding 12 inches (loose thickness) and compact to at least 95% of dry density (ASTM D 1557).

3.04 COMPACTION

Compaction shall be performed with approved compaction equipment suited to the soil and the area being compacted. 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 3.05 "Compaction Control Tests."

3.05 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.

3.06 PREPARATION FOR BASE COURSE

- A. Preparation of Subgrade: Immediately prior to placement of surfacing materials, clean the entire width of the area of all debris and dispose of as directed by the Engineer.

Shape the entire subgrade area to a smooth uniform surface, true to line, grade, and cross section. Compact material and density as determined by compaction tests ASTM Designation D1557.

- B. Finishing Subgrades: 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 base course and paving is placed.

Compact the subgrade for pavement to 95% of maximum density as defined for Compaction Control Density in Paragraph 3.05 "Compaction Control Tests" and these Specifications, to a minimum depth of six inches.

- C. Subgrade Protection: Take all precautions necessary to protect the subgrade from damage; hauling over the finished subgrade shall be limited to that which is essential for construction purposes. Equipment used for hauling over the prepared subgrade which, in the opinion of the 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. 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. 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.

3.07 SUSPECT MATERIALS, SAMPLING, TESTING, AND DISPOSAL

- A. Material on-site is assumed to be clean and acceptable for disposal or re-use. However, all excavated materials will be inspected and categorized as suspect or non-suspect by the Engineer or another Port representative. Soil will be considered suspect if it has an odor, sheen, or color typical of contaminated materials containing regulated materials.
- B. All suspect materials shall be stockpiled and segregated by the Contractor from other stockpiles or materials by the Contractor. The Port will provide and pay for sampling and characterization testing for all suspect materials prior to reuse or removal from the site.
 - 1. Suspect soils characterized to be free of regulated materials, and meeting the requirements of the contract documents, may be reused on-site provided it is suitable for its intended use, as determined by the Engineer.
 - 2. Suspect soils characterized to contain regulated materials, or not meeting the requirements of the contract documents, shall be loaded and transported and disposed of off-site. Work and costs related to transporting and disposing of said material will be considered Change Work..
 - 3. Surplus suspect soils characterized to be free of regulated materials, and meeting the requirements of the contract documents, shall be considered excavation including haul as part of the corresponding bid item. Surplus soils shall be loaded, transported, hauled, and disposed of off-site in accordance with the contract documents and applicable laws and regulations.
- C. All non-suspect soils shall be stockpiled by the Contractor, but segregated from suspect soils, and may be reused on-site provided they are suitable for the intended use, as determined by the Engineer, excess soil will be disposed of by the contractor.
- D. No soil shall be removed from the site without a completed soil profile and prior notification to the Engineer. Refer to Section 01 74 16 – Soil Characteristics and Waste Management for additional requirements.

END OF SECTION

PART 1 - GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

- A. The provisions and intent of the Contract, including the General Conditions and General Requirements, apply to this work as if specified in this section. Work related to this section is described in:
 - 1. Section 31 00 00 – Earthwork

1.02 DESCRIPTION OF WORK

- A. Work herein generally covers trenching, bedding, backfilling and compaction required for installation of utilities as shown in plan. 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.

1.03 SITE CONDITIONS

- A. The Port has subsurface investigations made at and near the proposed project site. The information is available as a reference document for review by the Contractor.
- 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.

1.04 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

2.01 PIPE BEDDING MATERIAL

- A. Refer for Section 31 00 00 - Earthwork

2.02 BACKFILL FOR DRAINS MATERIAL

- A. Refer to Section 31 00 00 – Earthwork

2.03 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 stockpiled beside the trench as it is removed and shall be backfilled from this position or wasted offsite.
- B. Soils that cannot be reused onsite and are anticipated to be exported to an off-site facility must have a completed soil profile prior to export. The Port will conduct testing of material as defined further in Section 01 74 16 – Soil Characteristics and Waste Management. The Contractor is responsible for any additional testing necessary to satisfy requirements of the Contractor's receiving facility.

3.02 TRENCH EXCAVATION

- A. The Contractor shall maintain, at all times during the execution of this work, safe and stable excavations. The length of trench excavation in advance of pipe laying shall be kept to a minimum. Excavations shall either be closed up at the end of the day or protected.
- B. Trenches must be of sufficient width, as shown in plan to permit proper installation and bedding of the pipe and/or conduit and to provide the required compaction of backfill.

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- C. All ledgerrock, boulders, and stones shall be removed to provide a minimum of 6 inches clearance under all portions of the pipe.
 - D. Placement of bedding material shall precede the installation of all pipe. This shall include necessary leveling of the native trench bottom or the top of the foundation material as well as placement and compaction of required bedding material to a uniform grade so that the entire length of pipe will be supported on a uniformly dense unyielding foundation.
 - E. When, after excavating to the foundation level, the material remaining in the trench bottom is determined to be unsuitable by the Engineer, excavation shall be continued to such additional depth and width as required by the Engineer. Unsuitable foundation materials shall be disposed of at an approved site. The trench foundation shall be backfilled to the bottom of the pipe zone with gravel backfill for foundations, gravel backfill for pipe zone bedding, or other suitable material, and compacted to form a uniformly dense, unyielding foundation.
 - 1. Unsuitable materials encountered during trench excavation shall be handled as specified in Section 01 74 16 – Soil Characteristics and Waste Management.
 - 2. No soil shall be removed from the site without a completed soil profile and prior notification to the Engineer.
 - F. All material excavated from trenches and piled adjacent to the trench shall be maintained so that the toe of the slope is at least 2 feet from the edge of the trench.
 - G. Excavation for manholes and other Structures connected to the pipelines shall be sufficient to provide a minimum of 12 inches between their surfaces and the sides of the excavation.
 - H. The Contractor shall furnish, install, and operate all necessary equipment to keep excavations above the foundation level free from water during construction, and shall dewater and dispose of the water so as not to cause injury to public or private property or nuisance to the public. Sufficient pumping equipment in good working condition shall be available at all times for all emergencies, including power outage, and shall have available at all times competent workers for the operation of the pumping equipment.

3.03 SHORING

- A. The Contractor shall provide all materials, labor, and equipment necessary to shore trenches to protect the Work, existing property, utilities, pavement, etc., and to provide safe working conditions in the trench. The Contractor may elect to use any combination of shoring, sliding trench shield, or other method of accomplishing the Work consistent with applicable local, State, or Federal safety codes.

Shoring to be removed, or moveable trench shields or boxes, shall be located at least 2 ½ pipe diameters away from metal or thermoplastic pipe if the bottom of

the shoring, shield, or box extends below the top of the pipe, unless a satisfactory means of reconsolidating the bedding or side support material disturbed by shoring removal can be demonstrated.

Damages resulting from improper shoring or failure to shore shall be the sole responsibility of the Contractor.

3.04 BEDDING AND BACKFILLING

- A. Backfill trenches with bedding material as specified and as called for on the Drawings. 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 conduit. Subsequent layers of trench backfill shall not exceed eight inches in loose thickness. 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 shown on the Drawings.

3.05 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 set forth in these Specifications.
- B. The Contractor shall properly place and compact all bedding and backfill material 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.

3.06 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 D1557, 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, and shall be performed in accordance with ASTM D1556, D2167 or D2922.

END OF SECTION

PART 1 - GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

- A. The provisions and intent of the Contract, including the General Conditions and General Requirements, apply to this work as if specified in this section. Work related to this section is described in:
1. Section 01 33 00 - Submittal Procedures
 2. Section 01 45 00 - Quality Control
 3. Section 02 41 00 - Demolition
 4. Section 31 00 00 - Earthwork
 5. Section 32 23 33 – Trenching and Backfilling

1.02 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.

1.03 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 – (2011) Mineral Filler for Bituminous Paving Mixtures
 2. AASHTO M 320 – (2010) Performance-Graded Asphalt Binder
 3. AASHTO M 323 - (2013) Superpave Volumetric Mix Design
 4. AASHTO T 11 - (2005; R2009) Materials Finer Than 75 μm (No. 200) Sieve in Mineral Aggregates by Washing
 5. AASHTO T 27 - (2011) Sieve Analysis of Fine and Coarse Aggregates
 6. AASHTO T 89 - (2013) Determining the Liquid Limit of Soils
 7. AASHTO T 90 - (2000; R2008) Determining the Plastic Limit and Plasticity Index of Soils
 8. AASHTO T 96 - (2002; R2010) Resistance to Degradation of Small-Size Coarse Aggregate and Impact in the Los Angeles Machine
 9. AASHTO T 104 - (1999; R2011) Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
 10. AASHTO T 112 - (2000; R2012) Clay Lumps and Friable Particles in Aggregate

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11. AASHTO T164 - (2011) Quantitative Extraction of Asphalt Binder from Hot Mix Asphalt (HMA)
 12. AASHTO T 176 - (2008) Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test
 13. AASHTO T 304 - (2011) Uncompacted Void Content of Fine Aggregate
 14. AASHTO T308 - (2010) Determining the Asphalt Binder Content of Hot Mix Asphalt (HMA) by the Ignition Method
 15. AASHTO T 312 - (2012) Preparing and Determining the Density of Hot Mix Asphalt (HMA) Specimens by Means of the Superpave Gyratory Compactor
 16. AASHTO T 335 - (2009) Determining the Percentage of Fracture in Coarse Aggregate
- D. American Society for Testing and Materials (ASTM)
1. ASTM D75 – (2009) Sampling Aggregates
 2. ASTM D4791 - (2010) 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; Current edition.
 2. Standard Specifications for Road, Bridge and Municipal Construction, M 41-10; Current edition.
 3. Materials Manual, M 46-01; Current edition.

1.04 SUBMITTALS

- A. A separate job mix formula shall be submitted in writing by the Contractor upon execution of the task order. Submittals shall represent all submittal elements specified herein and shall include as a minimum:
1. Mix designation/identification number.
 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. Temperature-viscosity relationship of the asphalt cement.
 - d. Minimum mixing temperature (degrees F).
 - e. 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.

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- e. Soundness.
 - f. LA Abrasion.
5. Fine Aggregate Certified Test Reports:
 - a. Source location and type of aggregate.
 - b. Bulk specific gravity.
 - c. Liquid limit.
 - d. Plasticity index.
 - e. Percent natural sand (if used).
 - f. Sand equivalent.
 - g. Uncompacted void content.
 6. Recycled Asphalt Pavement Test Reports (if used)
 7. Anti-strip agent:
 - a. Certification.
 - b. Amount used.
 8. Percentage and grade of performance graded asphalt binder.
 9. Proportions and percentage of each aggregate stockpile.
 10. Temperature of mix when discharged from the mixer.
 11. Plot of the blended aggregate gradation and gradation control points on the Federal Highway Administration (FHWA) 0.45 power gradation curve.
 12. Maximum specific gravity at the target binder content.
 13. Gyratory compaction curve for N_{max} .
 14. Bulk specific gravity at N_{design} gyrations.
 15. Air void content at $N_{initial}$, N_{design} , and N_{max} gyrations.
 16. Voids in mineral aggregate at N_{design} gyrations.
 17. Voids filled with asphalt at N_{design} gyrations.
 18. 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.
 19. 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 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 SI E
Coarse Aggregate	25 lbs.
Fine Aggregate	25 lbs.
Reclaimed Asphalt Pavement	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, then a new job mix formula must be tested and resubmitted for approval by the Engineer, before the new mix is used.

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 Materials Reference Laboratory (AMRL) program.
- 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. 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.
- D. Surface Grades: Grades shall conform to the tolerance requirements specified herein, except where closer tolerance is required for the proper functioning of structures and drainage as determined by the Engineer.

1.06 QUALITY ASSURANCE

- A. The Port will provide inspection services to the satisfaction of the Engineer. 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 Port from the office of the Port 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. Weather limitations shall be in accordance WSDOT Standard Specifications Section 5-04.3(1), as modified herein.
 - 2. In case of sudden rain, the Engineer may permit placing of mixture in transport from the plant, provided that the surface upon which the mix is being placed is free from pools of water. 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. 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.
- C. 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.
- D. 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 Section 9-03.8 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)	90% with 2 or more fractured faces 95% with 1 or more fractured faces
LA Abrasion Wear (AASHTO T 96, 500 revolutions)	30%, maximum
Sodium Sulfate Soundness Loss (AASHTO T 104, 5 cycles)	13%, 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 Section 9-03.8 and AASHTO M 323, as modified below:

Test	Specification
Sand Equivalent (AASHTO T 176)	45%, minimum
Uncompacted Void Content (AASHTO T 304, Method A)	44%, minimum
Plasticity Index (AASHTO T 90)	Non-plastic
Liquid Limit (AASHTO T 89)	25, maximum
Deleterious Materials (AASHTO T 112)	2%, maximum

- C. Mineral filler, when used, shall conform to the requirements of AASHTO M 17.
- D. 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.
 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 determination 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.

E. Aggregate Gradation

1. Each gradation contains maximum and minimum control points. Job mix formula gradation 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:

Design Aggregate Gradation Control Points	
Sieve	Class 1/2-inch
Sieve	(Percent Passing)
1-1/2"	-
1"	-
3/4"	100
1/2"	90-100
3/8"	75-90
No. 4	46-66
No. 8	-
No. 10	30-42
No. 40	11-24
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.

2.03 HOT MIX ASPHALT (HMA) MIX DESIGN

- A. Mix design shall be prepared in accordance with WSDOT SOP 732 as modified herein.
- B. Asphalt Binder: PG 58H-22.
- C. Aggregate Gradation: Class 1/2".

- D. Gyration levels for mix preparation shall conform to the following:

Mix Designation	N _{initial}	N _{design}	N _{max}
Class 1/2"	8	100	160

- E. The target air voids (V_a) of the mix design at the design number of gyrations shall be as follows:

Mix Designation	Air Voids (Percent)
Class 1/2"	4

- F. The voids filled with asphalt (VFA) at the target air void level shall be as follows:

Mix Designation	Voids Filled with Asphalt (Percent)
Class 1/2" Wearing Course	65 – 75

- G. The voids in mineral aggregate (VMA) of the HMA design shall be as follows:

Mix Designation	Voids in Mineral Aggregate (Percent)	
	Minimum	Maximum
Class 1/2"	14.0	16.0

- 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 Gyrations)	Required Density (of Theoretical Maximum Specific Gravity)
N _{initial}	%G _{mm} = 89
N _{design}	%G _{mm} = 96
N _{max}	%G _{mm} = 98

- I. The dust to binder ratio of the blended mix shall be between 0.6 and 1.6.
- 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). 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 TACK COAT

- A. Unless otherwise approved by the Engineer, the tack coat shall be CSS-1 or CSS-1h 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).

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. Compaction Equipment – Rollers shall conform to WSDOT Standard Specifications Section 5-04.3(3)E.
- E. 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.

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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.
- F. Preparation of the Aggregates:
1. The aggregate for the mixture shall be heated and dried 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.
- G. Preparation of Bituminous Mixture:
1. Mixing shall conform to WSDOT Standard Specifications Section 5-04.3(8), as modified herein.
 2. The aggregates and the bituminous material shall be properly proportioned and introduced into the mixer in the amount specified by the job mix formula.
 3. 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.
 4. The moisture content of all bituminous mix upon discharge shall not exceed one (1) percent.
- H. Preparation of the Underlying Surface:
1. Preparation shall conform to WSDOT Standard Specifications Sections 5-04.3(5) and 5-04.3(5)A, as modified herein.
 2. Asphalt materials shall not be placed until the underlying course has been tested by the Port's Representative and accepted by the Engineer.
 3. Immediately before placing asphalt materials, clean all underlying pavement surfaces and previous courses of all loose and foreign material by sweeping with hand brooms, power sweepers or blowers as directed by the Port's Representative or 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 Port inspector 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 dry, 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.
- I. 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 not be 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(9), 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 upon a wet surface or when the surface temperature of the underlying course is less than that specified below. 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

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.
8. Compaction of the asphalt mixture shall be in accordance with WSDOT Standard Specifications Section 5-04.3(10), as modified herein.

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- 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 (SOP) 729.
 - d. Engineer may evaluate cyclic density as described in WSDOT Standard Specifications Section 5-04.3(10)B to assess segregation.
9. 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.
10. 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.

3.02 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.

3.03 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).

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. The work includes the requirements for providing and installing striping and pavement markings as indicated on the Drawings. This work includes all labor, materials, and equipment to fabricate and install striping and pavement markings indicated on the Drawings.

1.02 QUALITY ASSURANCE

- A. Employ at least one 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 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

- A. 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.

PART 3 - EXECUTION

3.01 GENERAL

- A. Install access aisle striping and pavement markings as indicated on the Drawings and as directed by the Engineer.

3.02 SURFACE PREPARATION

- A. Sweep and clean surface to eliminate loose material and dust. All contaminants shall be removed within the areas to receive pavement markings. Large areas of tar, grease or foreign materials that may be present on the paved surface may require sandblasting, steam cleaning or power brooming to accomplish complete removal.

3.03 PAINT APPLICATION

- A. 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, 2020 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

- A. All paint markings shall be top dressed with beads. The application rate on paint 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.

END OF SECTION

PART 1 – GENERAL

1.01 SUMMARY

- A. Extent of Work: The work for concrete filled steel pipe bollards is indicated on the Drawings. The Work includes the requirements for transporting, locating and placing bollards and guard rail in accordance with these Specifications and the dimensions indicated on the Drawings or within the line and grade established by the Engineer.

1.02 QUALITY ASSURANCE

- A. Deliver materials to the site in Manufacturer's original, unopened containers and packaging. All packaging shall be clearly labeled with the product name and manufacturer.
- B. Forms shall be stored in accordance with the Manufacturer's instructions.
- C. Damaged forms shall not be used.

1.03 REFERENCES

- A. ASTM A 615/A 615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2018.
- B. ASTM C 33 - Standard Specification for Concrete Aggregates; 2018.
- C. ASTM C 150 - Standard Specification for Portland Cement; 2019.
- D. ASTM C 260 - Standard Specification for Air-Entraining Admixtures for Concrete; 2016.
- E. Washington State Department of Transportation (WSDOT) Standard Specifications for Road, Bridge and Municipal Construction and Amendments (2020 edition).

1.04 JOB CONDITIONS

- A. Existing Utilities:
 - 1. Underground utilities are indicated in the Drawings. The Contractor shall locate existing and new underground utilities in the area of the Work. Utilities which are to remain shall be adequately protected from damage by the Contractor.

1.05 SUBMITTALS

- A. The Contractor shall submit all data in accordance with Section 01330 – Submittals.
 - 1. Manufacturer's product data shall be submitted for review and approval by the Engineer.

PART 2 – PRODUCTS

2.01 BOLLARDS

- A. There are two types of bollards shown on the Drawings:
 - 1. Removable Traffic Bollard with bolted guard rail.
 - 2. Fixed Utility Protection Bollard with bolted guard rail.

- B. The bollards shall be schedule 40 steel pipe, 8 inches in diameter, primed and painted with two coats of "Safety Yellow." The steel pipe for the bollard shall be filled with commercial concrete (3,000 psi minimum).
- C. Bollards shall be a minimum of 4 feet above finished grade as shown in the Drawings.
- D. Embedment depth for bollards shall be 4 feet minimum as shown in the Drawings.
- E. The concrete foundation shall be 3,000 psi as shown on the Drawings.
- E. For the fixed utility protection bollard, the concrete foundation shall be a minimum of 6 inches deeper than the bottom of the embedded end of the bollard.
- F. Guard rails shall be schedule 40, 6 inch diameter, steel pipe and shall be primed and painted with two coats of "Safety Yellow."
- G. Guard rail connections shall be bolted to the bollard as shown on the Drawings.
- H. The top of the bollard shall be a formed concrete dome cap, matching the size of the forming tube as shown on the Drawings.
- I. The steel tube shall be prepared to be free of rust, dirt or other material, prior to priming and painting the bollard. The prime coat shall be a rust reducing paint.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Place and brace the forming tubes in accordance with manufacturer's instructions.
- B. Erect forming tubes at locations as shown in the Drawings. Forming tubes shall be erected plumb and level across the top.
- C. Place a cap or waterproof sheeting over the top of the forms to prevent damage to the interior surface from adverse weather conditions.
- D. Remove forms in accordance with the manufacturer's recommendations, after the concrete has achieved the design strength.
- E. Install grounding system on the bollards indicated on the Drawings. See Section 33 79 00 – Site Grounding.

3.02 CLEANUP

- A. Remove paint spatters, splashes, spills or drips to the satisfaction of the Engineer.

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. Certificates of compliance with load rating requirements for precast structures and metal castings.
 - 5. Shop drawings for precast catch basins and manholes.

PART 2 - PRODUCTS

2.01 STORM DRAINAGE PIPE

- A. 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 CLEANOUTS

- A. Cleanout lids shall be designed with the loading criteria shown in plans.

2.04 LATERAL CONNECTION TO STORMWATER MAIN

- A. Connection fitting shall be Romac style "CB" sewer saddle or approved equal.

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. 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 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.

3.05 INSTALLATION OF MANHOLES, CATCH BASINS AND CLEANOUTS

- 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 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 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 catch basin, extending at least one pipe length into each trench and tamp with selected material up to an elevation of six

inches above the crown of all entering pipes. Conform to the applicable provisions of Section 31 00 00 – “Earthwork”.

3.06 LATERAL CONNECTION TO STORMWATER MAIN

- A. The stormwater main or trunk line shall be core drilled to the diameter shown in the Drawings.
- B. Lateral shall not extend beyond the interior wall of the stormwater main or trunk line.

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 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 inch.

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 13 – Medium Voltage Cables and Accessories
 3. Section 26 05 19 – Low Voltage Electrical Power Conductors and Cables
 4. Section 26 05 33 – Raceways and Boxes for Electrical Systems
 5. Section 26 05 53 – Identification for Electrical System
 6. Section 26 12 16 – Medium Voltage Power Substations
 7. Section 26 24 16 – Panelboards
 8. Section 26 28 00 – MV Automatic Power Factor Correction Capacitors
 9. Section 33 77 00 - Medium Voltage Shore Power Switches in Walk-In Enclosures
 10. Section 33 79 00 – Site Grounding
 11. Section 31 00 00 – Earthwork
 12. Section 31 23 33 – Trenching and Backfilling

1.02 REFERENCES

- A. ASTM (American Society for Testing and Materials).
- B. NFPA 70 (National Fire Protection Association) – National Electrical Code.
- C. WSDOT/APWA Specifications, Section 6-02.3.
- D. Polyvinyl chloride (PVC) coated Rigid Steel Conduit: NEMA RN 1, UL 6, ANSI C80.1, and NFPA 70.
- E. Non-metallic, PVC, schedule 80: NEMA TC-2; UL 651, and NFPA 70.
- F. PVC Fittings for Use with Rigid PVC Conduit and Tubing: NEMA TC-3.

1.03 QUALITY ASSURANCE

- A. Listing and Labeling: Provide products 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 SUBMITTALS

- A. General: Submit the following in accordance with Section 01 33 00 – Submittal Procedures.

1. Product data for metal accessories for manholes/vaults, conduit and duct, duct bank materials, and miscellaneous components.
2. Record Documents: Show dimensioned locations of underground ducts, and manholes/vaults from nearest building or permanent structure.
3. Shop drawings showing details and design calculations for precast manholes/vaults including reinforcing steel. All loading shall be container equipment loading as shown on the drawings, unless otherwise indicated. Provide stamped drawings and calculations with State of Washington seal of registered professional structural engineer.
4. Certificate for concrete and steel used in underground precast concrete utility structures, according to ASTM C 858.
5. Inspection report for factory inspections, according to ASTM C 1037.
6. Record Documents: Show dimensional locations of underground ducts and manholes/vaults from nearest building or permanent structure.

1.05 DEFINITIONS

- A. Duct: Electrical conduit and other raceway, either metallic or nonmetallic, used underground, below wharf deck, embedded in earth or concrete.
- B. Ductbank: Two (2) or more conduits or another raceway installed underground in the same trench or concrete envelope.
- C. Handhole: An underground pullbox in a duct or ductbank.
- D. Manhole / Vault: An underground utility structure, large enough for a person to enter, with facilities for installing and maintaining wiring.
- E. Cable Rack: Heavy Duty Non-metallic wall mounted cable support racks, with stanchions, arms and cable ties to support cables.

1.06 COORDINATION

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

1.07 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 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.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Store precast concrete units at site as recommended by manufacturer to prevent physical damage. Arrange so identification markings are visible.

- B. Lift and support precast concrete units only at designated lifting or supporting points.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manholes/Vaults: Subject to compliance with requirements, provide products by one of the following:
 - 1. Oldcastle Infrastructure - Custom
 - 2. H2 Precast - Custom
 - 3. Or Engineer Approved Equal

2.02 CONDUIT AND DUCTS

- A. Metallic Conduit: PVC Coated Rigid Steel Conduit (PVRSC): UL 6, ANSI C80.1.
 - 1. Use for below grade transition of PVC conduit to above grade exposed conduit.
- 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: PVC-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. PVC Schedule 80 fittings shall be solvent welded type.
- C. All conduit elbows 30 degrees or greater shall be factory made, PVC coated rigid steel conduit. All 90-degree elbows shall be a minimum radius of 24" or greater.
- 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 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 HANDHOLES

- A. General: Precast concrete 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. Term-a-duct in sides of adequate number and spacing to accommodate ductbanks shown.
 - 4. Provide weep hole on two sides of the handhole, near bottom of handhole wall.

5. Provide grounding insert on one wall of the handhole. Bond to all metal components in handhole.
- B. Cover shall incorporate an all 316 stainless steel nitrogen gas spring, to achieve one-man lift capability, with a 20lb. maximum opening force through the 90-degree opening range. The cover latch shall be 316 stainless steel recessed handle with no above-grade protrusions, spring loaded handle return to closed position automatically. Concealed mounting hardware, all stainless-steel construction.
- C. A self-engaging hold-open bar shall be provided to safely hold the cover in the open position and to protect against cover over-travel while opening.

2.05 MANHOLES / VAULTS

- A. Precast Concrete Units: Rated minimum 200 KIP, interlocking, mating sections, complete with accessory items, hardware, and features as indicated on Drawings. Include term-a-ducts for conduit entrances and sleeves for ground rods.
- B. Design structure according to ASTM C 858.
- C. Joint Sealant: Continuous extrusion of asphaltic butyl material with adhesion, cohesion, flexibility, and durability properties necessary to withstand the maximum hydrostatic pressures at the installation location with the ground water level at grade.
- D. Source Quality Control: Inspect structures according to ASTM C 1037. Units shall be capable of supporting designed loads.
- E. Manhole/Vault Covers: Cast iron, capable of supporting minimum 200 KIP designed loads. Cast iron cover with cast-in legend "ELECTRIC", "CONTROL", or "COMMUNICATION" as appropriate. Machine cover-to-frame bearing surfaces.
- F. All manholes/vaults shall be set level on 12 inches of crushed surfacing base course, except where otherwise specifically directed by the Engineer. Contractor shall be responsible for measuring and calculating elevations which will result in top of manhole/vault flush with final asphalt paving grade. Contractor to provide riser extensions and/or grade rings to adjust for manhole depths as indicated in the ductbank profiles as shown on the Civil drawings. In the event the manhole/vault installation does not conform to the foregoing criteria, the contractor shall remove and re-install the manhole/vault. The surrounding area shall be repaved in accordance with the forgoing criteria and the paving specifications, all at no additional cost to the Port of Tacoma. Raising the manhole/vaults top section and blocking with brick and/or grout will not be accepted. The contractor shall perform the above at no additional cost to the owner. See Civil/Structural drawings and specifications for all wheel load requirements for electrical, control, and communications manholes/vaults.
- G. All manholes/vault lids over frames shall be field stamped with drawing ID.

2.06 ACCESSORIES

- A. Duct Supports shall be rigid PVC spacers selected to provide minimum NEC 2014 duct spacings. All horizontal spacers shall be staggered a minimum of 12 inches.
- B. Manhole/Vault Lifting Means
 1. Pulling Eyes in Walls: Eyebolt with reinforcing bar fastening insert. 2-inch diameter eye, 1-inch by 4-inch bolt. Working load with 6-inch embedment in 4000 psi concrete: 13,000 pounds minimum tension.

2. Pulling and Lifting Irons in Floor: 7/8-inch-diameter, hot-dipped galvanized, bent steel rod, stress relieved after forming, and fastened to reinforced rod. Exposed triangular opening. Ultimate yield strength: 40,000 pounds shear and 60,000 pounds tension.
- C. Sump Frame and Grate: Comply with FS RR-F-621, Type VII for frame and Type I for cover. Provide ground stud on frame and cover.
- D. Bolting Inserts for Cable Racks: Flared, threaded inserts of noncorrosive, chemical resistant, nonconductive thermoplastic material 3'-0" on center; 1/2-inch internal diameter by 2-3/4 inches deep, flared to 1-1/4-inch minimum at base. Tested ultimate pull-out strength: 12,000 pounds minimum.
- E. Expansion Anchors for Installation After Concrete is Cast: Zinc-plated carbon steel wedge type with stainless-steel expander clip, 1/2-inch bolt size, 5300-pound rated pull-out strength, and 6800-pound rated shear strength minimum.
- F. Manhole/Vault Hardware: Cables shall be well supported on walls by embedded cable racks. The cable racks shall consist of a stanchion that attaches to the manhole/vault wall in accordance with the manufacturer's recommendations and adjustable arms that lock into the stanchion.
 1. At least three (3) stanchions shall be installed on each eight-foot manhole/vault wall, two (2) stanchions on each six-foot manhole/vault wall, and one (1) stanchion on each four-foot manhole/vault wall.
 2. Minimum cable arm length shall be eleven inches. Cable rack arm lengths shall be appropriate for the manhole/vault size and amount of cable being installed.
 3. At least two spare arms shall be installed at each stanchion position.
- G. Cable Rack: Stanchions and arms shall be heavy duty non-metallic 50% glass reinforced nylon or other non-metallic material having equal mechanical strength, thermal resistance, chemical resistance, dielectric strength and physical properties. The Stanchion shall be 36 inches long, shall incorporate multiple-arm mounting holes that are 4 inches apart and recessed bolt mounting holes. Slots shall be provided in the arms for cable wire ties. The cable racks shall meet or exceed the 350 lbs. working load rating and shall be marked with the manufacturer's name, plant location and date manufactured. Cable rack components and accessories shall be Underground Devices Incorporated or equal.
- H. Ground Rods: Solid copper clad steel, 3/4-inch diameter by 10-foot length.
- I. Ground Wire: Stranded bare copper, #4/0 AWG minimum.
- J. Duct Sealing Compound: Nonhardening, 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. Comply with Specification Section 31 00 00 Earthwork.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine site to receive ducts, manholes/vaults for compliance with installation tolerances and other conditions affecting performance of the underground ducts. 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.

3.02 EARTHWORK

- A. Comply with Specification Section 31 00 00 Earthwork.

3.03 RACEWAY APPLICATIONS

- A. Refer to Specifications and Drawings for raceway materials. Where not specified otherwise, use PVC coated rigid steel conduit for elbows underground, embedded in Wharf, and in bullrail vaults.
- B. Nonmetallic conduit: PVC Schedule 80, use underground only.
 - 1. Underground Direct Burial: For medium-voltage and low-voltage applications. Use Schedule 80 Rigid Plastic Conduit as standard. Use PVC coated rigid steel conduit on turns 30° or greater.
- C. Use PVC 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 conduit and ducts as indicated on Drawings and according to manufacturer's written instructions.
- B. Slope: Pitch ducts minimum of two inches per 100 feet to drain toward manholes, vaults and handholes and away from buildings and equipment. Slope ducts from a high point in runs between manholes/vaults to drain in both directions.
- C. Curves and Bends: Use PVC coated rigid steel conduit on turns of 30 degrees or greater with a minimum radius of 36 inches for communications and 24 inches for electrical conduits. Galvanized rigid steel elbows shall be ½ lap wrapped with corrosion resistant tape. Use manufactured PVC rigid steel elbows for stub-ups at equipment and into buildings. Do not exceed 22 degrees for field bends without field review and approval by Engineer. Contractor shall field stake bend radius for field review prior to conduit installation for bends greater than 22 degrees.
- D. 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.
- E. Duct Entrances to Vaults and Manholes: Space end bells approximately 10 inches on center for 5-inch ducts and varied proportionately for other duct sizes. Change from regular spacing to end-bell spacing 10 feet from the end bell without reducing duct line slope and without forming a trap in the line. Grout end bells into vault/manhole and handhole walls from both sides to provide watertight entrances. Grout to be per specification Section 03 30 00 Cast-in-Place Concrete.

- F. Separation Between Direct-Buried, Non-Encased Ducts: Provide 2 inches minimum separation for like services, and 12 inches minimum between power and signal ducts, unless indicated otherwise on the drawings.
- G. Stub-Ups: Use PVC coated rigid steel conduit for stub-ups through concrete to equipment. Install insulated grounding bushings at the conduit terminations.
- H. Use PVC coated rigid steel for all exposed conduit for equipment mounted on outdoor concrete pads.
- I. Provide metallic line-warning tape per Specification 26 05 53 Identification for Electrical System. Bury warning tape approximately 12 inches above all ductbanks. Align tape parallel to and within 3 inches of centerline of ductbank. Provide an additional warning tape for each 18-inch increment of ductbank width over a nominal 18 inches. Space additional tapes 18 inches apart, horizontally.
- J. Pulling Cord: Install 150-pound- test nylon cord with distance markings in empty conduits, and conduits with conductors.
- K. Pull a properly sized mandrel through each conduit prior to installation of conductors or pull-lines to remove any materials trapped within the conduit run. Medium voltage conduits embedded in flowable thermal fill shall have a mandrel pulled within 24 hours of flowable thermal fill pour.
- L. Provide bell ends for all conduits entering and leaving existing or new precast concrete manholes/vaults, handholes, and pullboxes.
- M. All below grade conduit runs with two or more conduits shall be provided with manufactured conduit saddles.
- N. Minimum conduit size shall be 2" trade size for underground conduits, unless noted otherwise.

3.05 BACKFILLING

- A. Comply with Specification Sections 31 00 00 – Earthwork and 31 23 33 - Trenching and Backfilling.

3.06 MANHOLE / VAULT AND HANDHOLE INSTALLATION

- A. Install as indicated on Drawings, according to manufacturer's written instructions and ASTM C 891.
 - 1. Install manholes/vaults 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 manhole/vault units on a level bed of pea gravel, graded from the 1-inch sieve to the No. 4 sieve and compacted to the same density as the adjacent undisturbed earth.
 - 3. Drainage: Manholes/vaults shall have drain holes in the bottom. Provide sixteen inches minimum of pea gravel below the manhole/vault.
- B. Grounding:

1. Provide two ground rods through floor in vaults and manholes with the top of ground rods protruding 6 inches above the floor. Provide four ground rods in manholes/vaults with larger than 8-feet by 10-feet clear interiors.
 2. Ground all exposed metal components and metal hardware within the manhole/vault with #4/0 AWG bare copper ground conductor. This requirement includes the frame.
- C. Hardware: Install removable hardware, including pulling eyes, cable racks 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 4 anchors for each cable stanchion.
- D. Train cables neatly around corners and secure to cable racks using nylon wire ties.

3.07 IDENTIFICATION

- A. Identify raceways, cables and equipment as specified in Division 26, Section 26 05 53 "Identification for Electrical Systems."
- 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.
- D. Manhole/vault cast iron lids and frames provide field stamped identification corresponding to Drawing ID as indicated on final field and clean As-Built Drawings.

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 vaults, manholes and handholes, including sump.
- B. Duct Integrity: Swab out ducts with a mandrel 1/4 inch smaller in diameter than internal diameter of ducts.
- C. Grounding: Test manhole grounding to ensure electrical continuity of bonding and grounding connections. Measure ground resistance at each ground rod and document results. Use an instrument specifically designed for ground-resistance measurements.

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 01 26 – Acceptance Testing of Electrical Systems
 2. Section 26 05 00 – Common Work Results for Electrical
 3. Section 26 05 13 – Medium Voltage Cables and Accessories
 4. Section 26 05 19 – Low Voltage Electrical Power Conductors and Cables
 5. Section 26 05 33 – Raceways and Boxes for Electrical Systems
 6. Section 26 05 53 – Identification for Electrical System
 7. Section 26 05 73 – Overcurrent Protective Device Coordination Study
 8. Section 26 12 16 - Medium Voltage Power Substations
 9. Section 26 24 16 – Panelboards
 10. Section 26 28 00 – MV Automatic Power Factor Correction Capacitors
 11. Section 26 90 11 - High Voltage Shore Power Receptacles
 12. Section 33 71 19 – Electrical Underground Ducts and Manholes
 13. Section 33 79 00 – Site Grounding
 14. Section 03 33 00 – Cast-In-Place Concrete

1.02 WORK INCLUDED:

- A. Provide 15KV switchgear line up, rated 13.8kV (6.6kVSystem), 1,200 Amps, complete with accessories and ratings as indicated on the drawings and as specified herein.
- B. Switchgear line-up shall be NEMA 12 type, inside a walk-in enclosure, with following characteristics:
1. Arc-Resistant per ANSI/IEEE C37.20.7
 2. 1,200 Amp metal-clad enclosed vacuum circuit breaker units in separate compartments, (secondary main breaker and capacitor bank breaker).
 3. Copper bus throughout the switchgear line-up.
 4. Shore power disconnects.
 - a. Switches
 - b. Grounding provisions
 - c. Kirk-key interlocks
 - d. Batteries
 - e. Panelboard

5. Controls.
6. Programmable Logic Controller (PLC), HMI interface module, controls, metering, and SEL relays as shown on the drawings and described herein. In addition, it shall include a Siemens WinPM power monitoring system on the secondary main circuit breaker with required CTs and PTs. The Siemens WinPM power monitoring system on the main circuit breaker shall include all components and wiring, or equipment to be integrated with the existing Siemens WinPM system of the existing crane switchgear located next door of both Pier 3 and Pier 4 walk-in enclosures. The entire 15KV switchgear line up shall be provided within a UL labeled, walk-in, ANSI type 316 stainless steel, weather-tight enclosure with enclosed base, man doors, panic hardware, equipment access doors, branch circuit panel, metering cabinet with equipment, battery back-up lighting fixture, surface LED ceiling lights, light switches, exhaust fans, air vents, reverse acting thermostat, and 120V, 20A GFI receptacles. The entire walk-in enclosure shall bear the Washington State's Department of Labor & Industry's "Gold Label" for Factory Assembled Structures.

1.03 SUBMITTALS: 15kV (6.6kV SYSTEM) SHORE POWER SWITCHES ENCLOSURE

- A. Submittals shall be in accordance with Section 01 33 00 – Submittal Procedures.
- B. Equipment manufacturer shall provide a complete submittal/shop drawing package with scaled (1/4" = 1'-0") enclosure (shore power breakers and switches) floor plans, and interior/exterior elevation within thirty (30) days of contract award to permit contractor to accurately coordinate site and foundation work. Contractor shall provide building concrete foundation/slab drawings prepared by a Washington State licensed professional structural engineer and submit drawings to the Engineer for review and approval. These costs shall be included in the contractor's bid proposal. See paragraphs 2.15 and 3.03 for additional requirements.
- C. 15kV switchgear line-up shall be delivered to the job site. Offloading, site preparation, building foundations, shims, field assembly and testing shall be provided by the contractor. Provide stainless steel shims required for leveling the building on site. Equipment supplier shall coordinate and provide necessary information to contractor's structural engineer for design of concrete foundations. Contractor shall include cost of foundation/slab work in the bid proposal.

1.04 APPLICABLE CODES AND STANDARDS

- A. The applicable codes and standards listed below should be considered as part of this specification. The latest revision in effect at time of inquiry shall apply for all standards referenced.
 1. National Electrical Manufacturers Association (NEMA).
 2. Institute of Electrical and Electronic engineers (IEEE). IEC/IEEE 80005-1: 2019, IEC/ISO/IEEE 2019, Edition 2.0 2019-03 – Utility Connection in

Port – Part 1 – High Voltage Shore Connection (HVSC) Systems –
General Requirements.

3. National Electric Code (NEC).
 4. City of Tacoma Electrical Code.
 5. Washington State Administrative Code (WAC).
 6. American National Standards Institute, Inc. (ANSI).
 7. Occupational Safety and Health Administration (OSHA).
 8. Underwriters Laboratories (UL).
 9. City of Tacoma – International Building Code (IBC).
- B. It shall be the manufacturer's responsibility to be knowledgeable of these standards and codes.

1.05 SERVICE AND ENVIRONMENTAL CONDITIONS

- A. Unless otherwise specified this equipment is intended for use in ambient temperatures that do not exceed a maximum of 42C (108F) or a minimum of –30C (-22F).

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

- A. Eaton
- B. Schneider Electric (Square D)
- C. IEM
- D. ABB
- E. General Electric
- F. Siemens
- G. Or Engineer Approved Equal

2.02 CONSTRUCTION STANDARDS:

- A. The entire walk-in enclosure assembly shall meet or exceed applicable ANSI, IEEE, UL and NEMA Standards for medium voltage shore power equipment.
- B. The entire walk-in enclosure assembly shall bear the Washington State Department of Labor & Industry's "Gold Label" for Factory Assembled Structures.

2.03 QUALIFICATION AS ACCEPTABLE INSTALLER:

- A. The subcontractor installing the materials specified in this section shall meet the following qualifications:
 1. Organization has installed similar 13.8KV voltage electrical systems.
 2. Foreman and journeyman doing the installation are trained high voltage linemen.

3. Organization has proper tools for high voltage electrical work.
4. Above information shall be submitted for Engineer's review and approval as part of the shop drawing review process.

2.04 15KV SHORE POWER SWITCHES ENCLOSURE

- A. The roof, siding, and all exposed fastenings and accessories shall be non-rusting ANSI type 316 stainless steel metal. The structure shall be self-supporting and free standing. All metal work shall be free from burrs and sharp edges. Walk-in enclosure shall be manufactured per latest Washington State Labor & Industries Gold Seal requirements for Factory Assembled Structures.
- B. All enclosure's accessories shall be suitable for industrial or utility service and for salty air at the Port of Tacoma.
- C. The enclosure's stainless-steel base shall be constructed of structural steel members sized by design structural calculations and reinforced to meet or exceed specified static and dynamic loads. Structural members shall be located to coordinate with the enclosed equipment so as to properly support it and allow maximum access to equipment floor openings for cable penetration and access to rear of metal clad switchgear line-up through removable exterior panels.
- D. The enclosure's base shall be designed with base lifting lugs capable of lifting the fully equipped structure at the specified lifting points with deflection not to exceed maximum requirements of local regulatory authorities.
- E. The steel floor plate shall be minimum ¼" steel plate stitch welded to the structural base assembly.
- F. The installed structure shall be capable of supporting a minimum floor loading of 250 pounds per square foot.
- G. Structure walls, ceiling, and roof shall be insulated between the inner and outer walls with Foam insulation (Bead Board) 2 ½ inches thick minimum (R10.25).
- H. Structure walls shall be able to withstand a wind loading of 125 miles per hour.\
- I. The pitched roof shall be able to withstand a minimum live load of 40 pounds per square foot.
- J. It shall be the manufacturer's responsibility to coordinate all necessary alignment and interconnection between component sections. The entire assembly must be electrically and mechanically assembled into one single line-up at factory prior to final inspection and shipment.
- K. The enclosure must be shipped complete, without missing components or "ship shorts".
- L. Minimum of two 4' x 8' doors, with hands free exit hardware located one at each end of the enclosure is required to meet NEC electrical room requirements. Provide a hinged door, access panel behind each section of switchgear for wiring and service complete with hasps for padlocks (padlocks by Owner).

-
- M. The enclosure shall be ventilated with screened, rain tight intake air louvers, exhaust fan and reverse acting thermostat set at 80°F. Ventilation equipment shall be sized to keep enclosure below 120°F ambient. Provide standard furnace type air filters on air intakes. Seal all gaps in enclosure including floor area under switchgear line-up to prevent entrance of rodents.
 - N. Provide rain gutters the length of the enclosure over access doors and access panels. Provide downspouts at each building corner with splash guards.
 - O. Removable lifting lugs shall be provided with the enclosure for off-loading purposes.
 - P. Switchgear and other electrical equipment shall be installed within the enclosure as specified and as shown on the drawings. The equipment shall be electrically and mechanically functional after installation. Sufficient aisle space per the NEC and NESC shall be provided to withdraw removable elements and otherwise properly maintain and service the equipment.
 - Q. The enclosure shall have a 150A, 120/240V, 1Ph, 3W Main Breaker, 30 circuit, 10,000 AIC power panelboard with SPD protection for enclosure services. Provide required branch circuit breakers, including (2) 20/1P circuit breakers for loads external to walk-in enclosure area, and three (3) spare 20/1P and conduit/wire within the enclosure. The enclosure service power shall be from an internal source and shall serve lighting, fans, receptacles, heaters, etc. Each medium voltage switchgear compartment shall contain a 250-Watt integral thermostat heater with a disconnect switch at the heater. Each heater shall have a dedicated over current (fuse or circuit breaker).
 - R. The interconnection of all installed equipment, drawings and documentation attached shall be the responsibility of the manufacturer. All documentation shall be provided for review as part of the shop drawing review process. Three sets of bound approved documentation packages shall be provided with the enclosure delivery to the site.
 - S. All equipment shall be functionally tested at the factory after installation within the enclosure.
 - T. Certified production test reports indicating satisfactory completion of all inspection and test procedures shall be available upon request.
 - U. Upon request the equipment shall be made available for customer inspection prior to shipment.
 - V. Finish for, the exterior structural steel members, the interior and under floor steel surfaces (except stainless steel) shall be as follows.
 - 1. All structural steel surfaces shall be cleaned by blasting with steel shot to remove all oil, grease, dirt, mill scale, rust, corrosion, oxides, paint or other foreign matter. The surface finish shall comply with “nearly white” specifications of the Steel Structures Painting Council Standards (SSPC-SP-10). By-products from the blasting process shall be “blown off” with dry, compressed air. Prime coating shall proceed immediately after shot blasting. Should rust form on the surface prior to coating, the entire surface shall be re-blasted.

2. Coating Application: The steel surfaces shall be completely prime coated from top to bottom with nominal thickness of 1.5 mils of a rust inhibiting PPG red oxide alkyd primer. The steel surfaces shall be prime coated with an electrostatically applied wet coat of a one component, moisture cure, zinc rich, polyurethane coating in a single coat application with a normal thickness of 3 mils dry finish thickness (DFT). The steel surfaces shall be finish painted with an electrostatically applied wet coat of 2.5 mils of a standard gray similar to the switchgear line-up.
3. The paint finish shall exceed a minimum of 5000 hours salt spray testing and have a 5-year warranty from date of substantial completion.

2.05 15KV SWITCHGEAR LINE-UP DETAILS:

- A. Switchgear line-up shall consist of these assemblies, and as indicated on the drawings:
1. Source 15KV Switchgear line-up, arc-resistant per ANSI/IEEE C37.20.7, with 1,200A Buss.
 2. One 1,200 Amp frame, 15KV metal/clad, vacuum main circuit breaker with potential transformers (PT's) and current transformers (CT's) ratings as indicated on the drawings.
 3. One 1,200 Amp frame, 15KV metal/clad, vacuum circuit breaker with potential transformers (PT's) and current transformers (CT's) for the automatic power factor correction capacitors, ratings as indicated on the drawings.
 4. Three (3) 1,200 Amp frame, 15KV metal/clad, shore power switches.
 5. Power transformer (PT) to power the circuit breaker operators, heaters, and three (3) metering PTs to serve power monitors and trip relays.
 6. Circuit breaker control relays, types as indicated on the drawings.

Provide raceway in switchgear line-ups for data wiring to metering cabinet located remote (within 100') from switchgear. Provide metering cabinet, equipment, metering software, and touch screen HMI.

2.06 15KV SWITCHGEAR RATINGS:

- A. The complete switchgear line-up shall comply with these electrical ratings:
- | | |
|---------------------------------|--|
| 1. Circuit Breaker Interrupting | 500MVA |
| 2. Design Voltage | 15KV |
| 3. System Voltage | 6.6KV |
| 4. BIL | 95KV |
| 5. Momentary Rating | 25kA RMS SYM. (40kA ASYM) |
| 6. Main Bus Rating | 1200A, 15KV |
| 7. Fault Closing | 25,000A RMS Symmetrical (40,000A Asymmetrical) |

- B. The 6.6 kV system is a 3 wire plus neutral resistor grounded system served from the main substation. Tacoma Power Utility's rotation is "C-A-B". Contact Tacoma Power prior to connection and energizing the system.
- C. The potential transformers serving the walk-in enclosure controls and monitors shall be connected for proper installation, without a primary neutral connection. Provide a 6.6KV primary delta/wye connection with a 120/208 Volt grounded neutral secondary. A complete wiring and controls diagram of the actual connections shall be provided with the shop drawings for Engineer's review and approval.

2.07 15kV ENCLOSURE CONSTRUCTION:

- A. Each switch or draw-out circuit breaker bay shall be separately constructed to form a rigid free-standing unit. Adjacent bays shall be securely bolted together to form an integrated rigid structure. Each individual bay shall be braced to prevent distortion under normal operating conditions as well as during the interruption of short circuit currents.
- B. Each cubicle shall have a flanged front door over the circuit breaker assembly and contain sufficient cabling space to permit cable installation without routing of line and load side connections in front of circuit breaker compartment.
- C. Each cubicle shall have IR windows installed, to enable use of infrared cameras without opening the switch cubicle.
- D. All enclosure openings shall be screened to prevent the entrance of small animals, and barriered to inhibit the entrance of dust, sand, etc.
- E. Each circuit breaker shall have a trip relay flush mounted on the enclosure door.
- F. The 15KV walk-in enclosure line-up shall be fully assembled and tested at the factory prior to shipment. Large line-ups may be split to permit normal shipping and handling as well as for ease of rejoining at the job site. Each section shall be provided with adequate lifting means and shall be capable of being rolled or lifted into installation position and bolted to a concrete slab or foundation.
- G. All 15kV wiring shall enter and exit through the bottom of cubicles.
- H. Provide grounding studs in all cubicles.
- I. Provide portable lift truck for removal and installation of vacuum circuit breakers.

2.08 BUS AND CONNECTIONS:

- A. All bus shall be copper. Bolted contact surfaces shall be plated with tin or silver. Insulators and compartment thru-wall bushings shall be glass polyester.
- B. The design of the bus, connections and supports shall be consistent with the mechanical stresses produced by a short circuit current equivalent to the interrupting current rating of the associated circuit breaker at service voltage. All hardware used on conductors shall have high tensile strength and anti-corrosive plating.

- C. A code size ground bus shall run continuously through each line-up and be securely connected to the steel frame of each bay. Provide lug provisions for code size ground conductor connections. Provide ground studs in all compartments.
- D. Provisions shall allow convenient extension of both the main bus and the ground bus to future adjacent bays.

2.09 METAL ENCLOSED SHORE POWER LOAD BREAK SWITCHES

- A. Switches shall be mounted in a self-standing steel structure and 1200 Amp copper bus for connection to outgoing medium voltage cables to shore power receptacles.
- B. Operation shall be by a permanently installed long operating handle, up for closed and down for open and grounded on the front of the switch. Handle shall operate a quick-make, quick-break over-toggle operating mechanism linked to operate all three phases simultaneously.
- C. The contact closing arc shall occur at the ends of the switch blades, not on the main contact area. Closing force shall securely close the switch even into short circuit forces.
- D. Attached spring operated arcing blades shall direct the opening current arc through arc chutes. Arcing surfaces shall be tungsten.
- E. Each cubicle shall have IR windows installed, to enable use of infrared cameras without opening the switch cubicle.
- F. Ratings:
 - 1. Medium Voltage 15.0kV (6.6kV System).
 - 2. Impulse Withstand 95kV.
 - 3. 60 Cycle Withstand 36kV.
 - 4. Continuous Current 1,200 Amps.
 - 5. 1,200 Amp Switching 10 Operations.
 - 6. Momentary Amps 61,000 ASYM.
 - 7. 2 Second Amps 38,000 ASYM.
 - 8. Fault Closing Amps 61,000 ASYM.
 - 9. S.C. Rating 500 MVA.
 - 10. Mechanical Endurance 100,000 Operations.
- G. Acceptable Manufacturers:
 - 1. Eaton
 - 2. Schneider Electric (Square D)
 - 3. IEM
 - 4. ABB

5. Siemens
6. General Electric
7. Or Engineer Approved Equal

2.10 METAL CLAD VACUUM CIRCUIT BREAKERS:

- A. Vacuum Circuit Breakers shall be rated 15 KV (6.6kV system) per drawings – ungrounded, with ampere ratings as shown on the drawings, and 500 MVA short circuit rating.
- B. Vacuum Circuit Breakers shall each include a tripping power source without batteries.
- C. All vacuum circuit breakers shall be draw-out type.
- D. Each vacuum circuit breaker cubicle shall have IR windows installed, to enable use of infrared cameras without opening the breaker cubicle.
- E. Provide a tripping relay on the door of each vacuum breaker. Controls shall coordinate trip settings with the feeder breaker and upstream protection. Provide both over-current and ground fault sensing and tripping with solid state adjustable SEL relays; provide trip curves for the relays. Trip relays shall have selectable long-time trip curves, short-time trip settings and instantaneous current settings for phase currents, time delay and current settings for ground fault currents, and zone selective interlocking to delay tripping of the main breaker when any feeder breaker senses the fault current. Relays shall be Schweitzer SEL-351A, or Engineer approved equal.
- F. Ground Continuity Monitor
 1. Provide a ground continuity monitor and relay on the door. Provide internal wiring in switchgear to route sensing wires to terminal block on the side wall of the respective rear compartment for connection to power cable ground check conductors.
- G. Instrumentation and controls for each vacuum breaker:
 1. Each breaker shall have an open/close switch, plus red and green pilot lights for closed/open position, a tripping relay, all on the front of the draw-out breaker door. They shall also have a C/T shorting device and an anti-pumping relay mounted inside behind the breaker door
- H. Potential Transformers (PT's)
 1. Provide one draw-out PT for closing circuit breakers. Provide three (3) draw-out PT's for tripping relays.
- I. Current Transformers (CT's)
 1. Provide three (3) C/T's for each vacuum breaker.
 2. The current transformers on each vacuum breaker shall be rated as follows:
 - a. Main breaker size as indicated on the drawings: Burden B0.5, accuracy 0.3, class C50.

- b. Automatic power factor correction capacitor bank circuit breaker size as indicated on the drawings: Burden B0.5, accuracy 2.4, class C20.

2.11 CONTROL POWER TRANSFORMER

- A. The control power transformer shall be rated 25kVA, 6.6kV-120/240V, 1-phase, 3-wire, 60 Hz. The transformer primary shall have copper windings, with a cast epoxy primary and resin impregnated secondary windings, or Engineer Approved Equal. Transformer shall have (2) taps, (1) at +2.5%, and (1) at -2.5%.

2.12 NAMEPLATES:

- A. Provide engraved phenolic nameplates for electrical equipment identification for each cubicle, instrument and disconnect device for the entire switchgear line-up. The central nameplate for the switchgear shall include, voltage, phase and short circuit rating. Each circuit breaker and each switch nameplate shall include load designation, circuit breaker or switch size and type. Furnish complete list with submittal. Provide all OSHA required labels.
- B. Provide one job nameplate on the main breaker line-up with the following information:
 - 1. Port of Tacoma Terminal #3 (or Port of Tacoma Terminal #4)
 - 2. Elcon Associates, Inc. – Seattle, WA
 - 3. Electrical Contractor's Name
 - 4. Year of manufacture

2.13 PRIMARY RISER DIAGRAM:

- A. Provide a primary system riser diagram(s) that shows switchgear line up, bussing and wiring connections. Diagram shall utilize non-fading ink and paper sealed in plastic and mounted to the exterior of the main breaker line-up within the enclosure a plexi-glass front frame. Submit preliminary draft to project Engineer for approval prior to final fabrication.

2.14 WARRANTY

- A. Provide an equipment warranty for the 15KV (6.6kV system) switchgear line-up in the walk-in enclosure, and the walk-in-enclosure itself. This equipment warranty shall cover a five (5) year period after date of substantial completion.

2.15 DOCUMENTATION

- A. Drawings
 - 1. Prior to fabrication of the 15KV (6.6kV system) switchgear, the following drawings shall be submitted by the manufacturer for approval.
 - a. Elevation views.
 - b. Base plan including mounting details, cable entry area, and door swing requirements.
 - c. Enclosure services electrical diagram.

- d. Component bill of material indicating quantity, description, and part number.
- e. Detailed electrical interconnection diagram for all equipment installed.
- f. Diagrams shall be based upon data sheets, interconnection documents, and system design requirements attached to this specification.
- g. After the return of approval drawings or after any changes made to previously approved drawings, the manufacturer shall submit a record copy of any and all drawings that contained revisions.
- h. After completion of the inspection and testing procedures, the manufacturer shall submit a complete set of "as built" drawings. These drawings shall function as a record of the final construction of the equipment at the time it left the factory.

2.16 SHORT CIRCUIT, COORDINATION, AND ARC FLASH STUDY

- A. The 15KV equipment supplier shall contact Tacoma Power for data associated with primary side short circuit availability and over current protection coordination.
- B. The 15KV equipment supplier shall prepare and provide a short circuit, coordination, and arc flash study, recommended protective device settings including ground fault with representative curves for engineer's review and approval. The 15kV supplier shall prepare an arc flash study and provide all arc flash labels and attach on the switchgear.
- C. Provide a minimum of three (3) copies (owner/engineer/contractor) as part of the shop drawing review.
- D. As part of the final submittal (corrected shop drawing submittal). Provide seven (7) copies. These will be used for owner/engineer/ contractor/independent testing agency/ O&M Manuals.

PART 3 - EXECUTION

3.01 MOUNTING

- A. The 15KV switchgear line-up shall be provided within a weather tight, insulated, heated (40-degree Fahrenheit), lighted, stainless steel, walk-in enclosure with floor to be installed on a reinforced concrete base or slab suitable for the enclosure and meeting all Washington State and local building codes.
- B. Screen or seal all switchgear compartment openings after cable installation.
- C. All switchgear equipment shall be secured to prevent overturning from earthquakes with 1/2" x 8" minimum steel foundation anchor J bolts or Engineer Approved Equal. Bolts shall be set in the sub-base decking and/or exterior pad and extend through the pad with sufficient threads to attach the equipment.

3.02 WIRING

- A. All wiring shall conform to the National Electrical Code and Industry Standards.

- B. All wiring shall be secured to switchgear enclosure with cleats. Maximum spacing shall not exceed 24 inches.

3.03 SPACE

- A. Verify space available with equipment sizes and code required working clearances prior to submittal of shop drawings. Equipment supplier shall include scaled equipment layout with dated signature stating spaces have been verified. Lack of this information with submittal will be grounds for rejection and require re-submittal.

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 01 26 – Acceptance Testing of Electrical Systems
 2. Section 26 05 00 – Common Work Results for Electrical
 3. Section 26 05 13 – Medium Voltage Cables and Accessories
 4. Section 26 05 19 – Low Voltage Electrical Power Conductors and Cables
 5. Section 26 05 33 – Raceways and Boxes for Electrical Systems
 6. Section 26 05 53 – Identification for Electrical System
 7. Section 26 12 16 - Medium Voltage Power Substations
 8. Section 26 24 16 – Panelboards
 9. Section 26 27 26 – Wiring Devices
 10. Section 26 28 00 – MV Automatic Power Factor Correction Capacitors
 11. Section 33 71 19 – Electrical Underground Ducts and Manholes
 12. Section 33 77 00 - Medium Voltage Shore Power Switches in Walk-In Enclosures

1.02 SUMMARY

- A. This Section includes grounding of electrical systems and equipment. Grounding requirements specified in this Section may be supplemented by special requirements of systems described in other Sections.
- 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.

1.03 REFERENCES

- A. ASTM B8.
- B. NFPA 70 (National Fire Protection Association) – National Electrical Code.
- C. ANSI/UL 467 - (Underwriter's Laboratory) - Grounding and Bonding Equipment.

1.04 QUALITY ASSURANCE

- A. Listing and Labeling: Provide electrical components, devices, and accessories 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 specific types, sizes, and combinations of conductors and connected items.
- B. Comply with IEEE 837 and UL 467.
- C. Comply with IEEE Std. 142 (Green Book).
- D. Comply with NFPA 70.

- E. Comply with IEEE C2 for medium-voltage underground construction.

1.05 SUBMITTALS

- A. General: Submit the following in accordance with Section 01 33 00 – Submittal Procedures.
 - 1. Product Data: For each type of product indicated.
- B. Field Test Reports: Submit written test reports to include the following:
 - 1. Test procedures used.
 - 2. Test results that comply with requirements.
 - 3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Grounding Conductor Fittings:
 - a. Erico Inc.
 - b. Chance/Hubbell.
 - c. Copperweld Corp.
 - d. Erico Inc.; Electrical Products Group.
 - e. Framatome Connectors/Burndy Electrical.
 - f. Ideal Industries, Inc.
 - g. ILSCO.
 - h. Kearney/Cooper Power Systems.
 - i. Lyncole XIT Grounding.
 - j. O-Z/Gedney Co.
 - k. Racco, Inc.; Division of Hubbell.
 - l. Thomas & Betts, Electrical.
 - m. Or Engineer Approved Equal
 - 2. Grounding Connectors and Rods:
 - a. Erico.
 - b. ILSCO.
 - c. Lyncole XIT Grounding.
 - d. O-Z/Gedney.
 - e. Racco, Inc.; Division of Hubbell.

- f. Thomas & Betts
- g. Or Engineer Approved Equal

2.02 GROUNDING CONDUCTORS

- A. For insulated conductors, comply with Division 26, Section 26 05 19 Low Voltage Electrical Power Conductors and Cables.
- B. Material: Copper.
- C. Equipment Grounding Conductors: Insulated with green-colored insulation.
- D. Grounding Electrode Conductors: Stranded cable.
- E. Underground Conductors: Bare, tinned, stranded.
- F. Bare Copper Conductors: Assembly of stranded conductors, ASTM B 8.
- G. Copper Bonding Conductors:
 - 1. Bonding Conductor: #2 AWG, stranded copper conductor.
 - 2. Bonding Jumper: Bare copper tape, braided bare copper conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
- H. Bonding Straps: Soft copper.
- I. Grounding Bus: Bare, annealed copper bars of rectangular cross section, with insulators.

2.03 CONNECTORS

- A. Pressure Connectors: High-conductivity-plated units.
- B. Bolted Connectors: Heavy-duty, bolted-pressure-type.
- C. Welded Connectors: Exothermic-welded type, in kit form, and selected per manufacturer's written instructions.

2.04 GROUNDING ELECTRODES

- A. Ground Rods: Solid copper clad steel, 3/4-inch diameter by 10-foot length.

2.05 GROUND BUS

- A. Ground bus: Copper, mounted on stand-off insulators. Size and location as shown on drawings, or required per NEC.

PART 3 - EXECUTION

3.01 APPLICATION

- A. Copper conductors for both insulated and bare grounding conductors in direct contact with earth, concrete, masonry, crushed stone, and similar materials.
- B. In raceways, use insulated equipment grounding conductors.
- C. Exothermic-Welded Connections: Use for connections to structural steel, rail, rebar and for underground connections.
- D. Equipment Grounding Conductor Terminations: Use bolted pressure clamps.

- E. Ground Rod Clamps at Manholes and Vaults: Use bolted pressure clamps with at least two bolts.
- F. Grounding Bus: Install in power substations, walk-in enclosures, shore power vaults, and all manholes/vaults.
 - 1. Use insulated spacer; space 1 inch from wall and support from wall 18 inches above finished floor, unless otherwise indicated.

3.02 EQUIPMENT GROUNDING CONDUCTORS

- A. Comply with NFPA 70, Article 250, for types, sizes, and quantities of equipment grounding conductors, unless specific types, larger sizes, or more conductors than required by NFPA 70 are indicated.
- B. Install equipment grounding conductors in all feeders and branch circuits unless otherwise noted.
- C. Nonmetallic Raceways: Install an equipment grounding conductor in all nonmetallic raceways unless they are designated for telephone or data cables.

3.03 INSTALLATION

- A. Ground Rods: Install at the ground grid locations as shown on the drawings.
 - 1. Drive ground rods until tops are 2 inches below final grade, unless noted otherwise.
 - 2. Interconnect ground rods with grounding electrode conductors (grid) as shown on the drawings. Use exothermic welds. Make connections without exposing steel or damaging copper coating.
- B. Grounding Conductors: Route along shortest and straightest paths possible. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- C. Bonding Straps and Jumpers: Install so vibration by equipment mounted on vibration isolation hangers and supports is not transmitted to rigidly mounted equipment.
 - 1. Use exothermic-welded connectors for outdoor locations, unless a disconnect-type connection is required; then, use an approved bolted clamp.
 - 2. Bond straps directly to the basic structure taking care not to penetrate any adjacent parts.
 - 3. Install straps only in locations accessible for maintenance.
- D. Metal Water Service Pipe: Provide insulated copper grounding conductors, in conduit, from main service equipment, or grounding bus, to all metal water service locations around the power substations and walk-in enclosures.
 - 1. Connect grounding conductors to main metal water service pipes by grounding clamp connectors.
 - 2. Where a dielectric main water fitting is installed, connect grounding conductor to street side of fitting.
 - 3. Bond metal grounding conductor conduit or sleeve to conductor at each end.

- E. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with grounding clamp connectors.
- F. Install one ground test well for each service at the ground rod electrically closest to the service entrance. Set top of well flush with finished grade.

3.04 CONNECTIONS

- A. General: Make connections so galvanic action or electrolysis possibility is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.
 - 1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer to order of galvanic series.
 - 2. Make connections with clean, bare metal at points of contact.
 - 3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
 - 4. Make aluminum-to-galvanized steel connections with tin-plated copper jumpers and mechanical clamps.
 - 5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.
- B. Exothermic-Welded Connections: Comply with manufacturer's written instructions. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.
- C. Noncontact Metal Raceway Terminations: If metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each conduit with a grounding bushing.
 - 1. Connect grounding bushings with a bare grounding conductor to grounding bus or terminal in housing.
 - 2. Bond electrically noncontinuous conduits at entrances and exits with grounding bushings and bare grounding conductors, unless otherwise indicated.
- D. Connections at Test Wells: Use compression-type connectors on conductors and make bolted and clamped-type connections between conductors and ground rods.
- E. Tighten screws and bolts for grounding and bonding connectors and terminals according to manufacturer's published torque-tightening values.
- F. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by connector manufacturer. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on the grounding conductor.
- G. Moisture Protection: If insulated grounding conductors are connected to ground rods or grounding buses, insulate entire area of connection and seal against moisture penetration of insulation and cable.

3.05 UNDERGROUND DISTRIBUTION SYSTEM GROUNDING

- A. Ductbanks: Provide a #4/0 WAG copper ground conductor within each CDF (concrete) encased medium-voltage duct bank, along the entire length of the ductbank and bond to manhole/vault ground bus.
- B. Vaults, Manholes and Handholes: Install 2 driven ground rods at corners of each manhole. Set rod depth so 6 inches will extend above finished floor. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive tape or heat-shrunk insulating sleeve from 2 inches above to 6 inches below concrete. Seal floor opening with waterproof, non-shrink grout. Provide continuous #4/0 AWG bare copper ground loop conductor all around vault, manhole and attached to all ground rods and to ground bus. Locate loop at plus 6 inches above manhole floor.
- C. Connections to Vault/Manhole Components: Connect all exposed-metal parts, such as inserts, cable racks, pulling irons, cover frame, cover, sump ladders, and cable shields within each manhole to ground loop conductor and ground bus.
 - 1. Make connections with #4/0 AWG minimum, stranded, hard-drawn copper conductor.
 - 2. Train conductors level or plumb around corners and fasten to manhole walls.
 - 3. Make connection to cable shield as recommended by manufacturer of splicing and termination kits.
 - 4. Connect equipment grounding conductor in each conduit to ground loop and ground bus.

3.06 IDENTIFICATION

- A. Identify grounding system components as required by the Authority Having Jurisdiction and as specified in Division 26, Section 26 05 53 Identification for Electrical Systems.

3.07 FIELD QUALITY CONTROL

- A. Testing: Perform the following field quality-control testing:
 - 1. After installing grounding system but before permanent electrical circuitry has been energized, test for compliance with requirements.
 - a. Measure ground resistance without the soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
 - b. Test by one of the following methods for resistance measurement:
 - 1) Perform fall of potential test per IEEE Standard No. 81, Section 9.04 on the main grounding electrode or system for each substation and building.
 - 2) Perform the two-point method test per IEEE No.81 Section 9.03 to determine the ground resistance between the main grounding system and all major electrical equipment frames, system neutral and/or derived neutral points.
 - 3) Alternate Method: Perform ground continuity test between main ground system and equipment frame, system neutral and/or derived neutral point. Conduct test by passing a minimum of ten amperes DC current

between ground reference system and the ground point to be tested.
Measure voltage drop and calculate resistance by voltage drop method.

- c. Test Requirements:
 - 1) Equipment rated and manhole/handhole grounds: 10 ohms.
 - d. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Engineer promptly and include recommendations to reduce ground resistance.
2. Record test results on a Ground Resistance Test Report form for inclusion in the O & M Manuals.
- B. Provide drawings locating each ground rod and ground rod assembly and other grounding electrodes and ground grid.
1. Identify each ground rod by letter in alphabetical order, and key to the record of tests and observations.
 2. Include the number of rods driven and their depth at each location and include observations of weather and other phenomena that may affect test results.

END OF SECTION

**Port of Tacoma
Terminal 3 & Terminal 4 Shore Power Project**

**Appendix A
SWPPP Short Form**

CONSTRUCTION SWPPP SHORT FORM

The threshold for using the Port of Tacoma’s (Port) short form is a project that proposes to clear or disturb less than one acre of land. Projects falling within this threshold may use this short form instead of preparing a professionally designed Construction Stormwater Pollution Prevention Plan (SWPPP). If project disturbance quantities exceed this threshold, you must prepare of formal Construction SWPPP as part of your submittal package. If your project is within the threshold and includes—or may affect—a critical area, please contact the Port to determine if the SWPPP short form may be used.

CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN SHORT FORM

Project Name:

Address:

Contact/Owner:

Phone:

Erosion Control Supervisor:

Phone:

Cell:

Pager:

Emergency (After hours) Contact:

Phone:

Permit No.:

Parcel No.:

Required Submittals

A Construction SWPPP consists of both a project narrative and a site plan. The project narrative describes existing conditions on the site, the proposed conditions, and how construction site runoff will be managed until final site stabilization is achieved. Any additional relevant information should be included in the project narrative. All Best Management Practices (BMPs) that will be utilized onsite must be included as part of the project narrative and provided (electronically or hard copy) as part of the submittal package. If additional BMPs beyond those included in the Washington Department of Ecology's (Ecology) Western Washington Stormwater Management Manual (Ecology SWMM) or the City of Tacoma's (City) Stormwater Management Manual (City SWMM) are proposed to be used, a narrative and appropriate details describing the BMP (its function, installation method, and maintenance activities) will be required.

The site plan is a drawing which shows the location of the proposed BMPs to control erosion and sedimentation during and after construction activities.

The City's govMe site (<http://www.govme.org>.) may be used to find much of the information needed to complete this form, such as adjacent areas, topography, critical areas, the downstream drainage path, and information concerning onsite features.

PROJECT NARRATIVE

The Construction SWPPP Short Form narrative must be completed at part of the submittal package. Any information described, as part of the narrative, should also be shown on the site plan.

Note: From October 1 through April 30, clearing, grading, and other soil disturbing activities shall only be permitted by special authorization from the Port.

A. Project Description (Check all that apply)

- New Structure Building Addition Grading/Excavation
 Paving Utilities Other:

1. Total project area _____ (square feet)
2. Total proposed impervious area _____ (square feet)
3. Total existing impervious area _____ (square feet)
4. Total proposed area to be disturbed _____ (square feet)
5. Total volume of cut/fill _____ (cubic yards)

Additional Project Information:

B. Existing Site Conditions (Check all that apply)

1. Describe the existing vegetation on the site. (Check all that apply)

Forest Pasture/field grass Pavement Landscaping Brush
 Trees Other:
2. Describe how surface water (stormwater) drainage flows across/from the site. (Check all that apply)

Sheet Flow Gutter Catch Basin Ditch/Swale Storm Sewer
 Stream Other:
3. Describe any unusual site condition(s) or other features of note.

Steep Grades Large depression Underground tanks Springs
 Easements Existing structures Existing utilities Other:

C. Adjacent Areas (Check all that apply)

1. Check any/all adjacent areas that may be affected by site disturbance and fully describe below in item 2:

Streams* Lakes* Wetlands* Steep slopes*
 Residential Areas Roads Ditches, pipes, culverts Other:

** If the site is on or adjacent to a critical area (e.g., waterbody), the Port may require additional information, engineering, and other permits to be submitted with this short form.*

2. Describe how and where surface water enters the site from properties located upstream:

3. Describe the downstream drainage path from the site to the receiving body of water (minimum distance of 0.25 mile [1320 feet]). (E.g., water flows from the site into a curb-line, then to a catch basin at the intersection of X and Y streets. A 10-inch pipe system conveys water another 1000 feet to a wetland.) Include information on the condition of the drainage structures.

D. Soils (Check all that apply)

The intent of this section is to identify when additional soils information may be required for applicants using this short form. There are other site-specific issues that may necessitate a soils investigation or more extensive erosion control practices. The Port will determine these situations on a case-by-case basis as part of their review.

1. Does the project propose infiltration? Infiltration systems require prior Port approval.

Yes No

2. Does the project propose construction on or near steep slopes (15% or greater)?

Yes No

If infiltration is proposed for the site or steep slopes (15% or greater) have been identified, the Port will require soils information as part of project design. The applicant must contact a soil professional or civil engineer that specializes in soil analysis and perform an in-depth soils investigation. If the Yes box is checked for either question, the Port may not permit the use of this short form.

E. Construction Sequencing/Phasing

1. Construction sequence: the standard construction sequence is as follows:
 - Mark clearing/grading limits.
 - Install initial erosion control Best Management Practices (BMPs) (e.g., construction entrance, silt fence, catch basin inserts, etc.).
 - Clear, grade, and fill project site as outlined in the site plan while implementing and maintaining proper temporary erosion and sediment control BMPs simultaneously.
 - Install permanent erosion protection as described in the specifications (e.g., impervious surfaces, landscaping, etc.).
 - Remove temporary erosion control methods as permitted. Do not remove temporary erosion control until permanent erosion protection is fully established.

List any changes from the standard construction sequence outlined above:

2. Construction phasing: if construction is going to occur in separate phases, please describe:

F. Construction Schedule

1. Provide a proposed construction schedule (dates construction starts and ends, and dates for any construction phasing.)

Start Date:

End Date:

Interim Phasing Dates:

Wet Season Construction Activities: Wet season occurs from October 1 to April 30. Please describe construction activities that will occur during this time period.

Note: Additional erosion control methods may be required during periods of increased surface water runoff.

2. Site plan

A site plan, to scale, must be included with this checklist that shows the following items:

- a. Address, Parcel Number, Permit Number, and Street Names
- b. North Arrow
- c. Indicate boundaries of existing vegetation (e.g., tree lines, grassy areas, pasture areas, fields, etc.)
- d. Identify any onsite or adjacent critical areas and associated buffers (e.g., wetlands, steep slopes, streams, etc.).
- e. Identify any FEMA base flood boundaries and Shoreline Management boundaries.
- f. Show existing and proposed contours.
- g. Delineate areas that are to be cleared and/or graded.
- h. Show all cut and fill slopes, indicating top and bottom of slope catch lines.
- i. Show locations where upstream run-on enters the site and locations where runoff leaves the site.
- j. Indicate existing surface water flow direction(s).
- k. Label final grade contour and indicate proposed surface water flow direction and surface water conveyance systems (e.g., pipes, catch basins, ditches, etc.).
- l. Show grades, dimensions, and direction of flow in all (existing and proposed) ditches, swales, culverts, and pipes.
- m. Indicate locations and outlets of any dewatering systems (usually to sediment trap).
- n. Identify and locate all erosion control methods to be used during and after construction.

ONSITE FIELD VERIFICATION OF ACTUAL CONDITIONS IS REQUIRED.

Figure 1. (see page 5 for Site Plan requirements)

GUIDELINES FOR EROSION CONTROL ELEMENTS

This SWPPP must contain the 12 required elements, as required by Ecology. Check off each element as it is addressed in the SWPPP short form and/or on your site plan.

- 1. Mark Clearing Limits
- 2. Establish Construction Access
- 3. Control Flow Rates
- 4. Install Sediment Controls
- 5. Stabilize Soils
- 6. Protect Slopes
- 7. Protect Drain Inlets
- 8. Stabilize Channels and Outlets
- 9. Control Pollutants
- 10. Control Dewatering
- 11. Maintain BMPs
- 12. Manage the Project

The following is a brief description of each of the 12 required elements of a SWPPP. If an element does not apply to the proposed project site, please describe why the element does not apply. Applicable BMPs are listed with each element and in Table 1. Please note that this list is not a comprehensive list of BMPs available for small construction projects, but erosion and sediment control techniques most pertinent to small construction sites are included here. More detailed information on construction BMPs can be found in Ecology's SWMM Volume II and the City's SWMM Volume II (Ecology 2005; City of Tacoma 2012). Please provide hard copies of the BMPs that will be used for the project and include as part of this Construction SWPPP. BMPs that may be used if needed can be noted as being contingent in the event additional erosion control is needed. Describe any additional BMPs that will be utilized onsite and add them to the SWPPP short form.

For phased construction projects, clearly indicate erosion control methods to be used for each phase of construction.

Element #1 – Mark Clearing Limits

All construction projects must clearly mark any clearing limits, sensitive areas and their buffers prior to beginning any land disturbing activities, including clearing and grading. Clearly mark the limits both in the field and on the site plans. Limits shall be marked in such a way that any trees or vegetation that is to remain will not be harmed.

Applicable BMPs include:

- BMP C101: Preserving Natural Vegetation
- BMP C102: Buffer Zones
- BMP C103: High Visibility Plastic or Metal Fence
- BMP C104: Stake and Wire Fence

The BMP(s) being proposed to meet this element are:

OR

This element is not required for this project because:

Element #2 – Establish Construction Access

All construction projects subject to vehicular traffic shall provide a means of preventing vehicle “tracking” soil from the site onto streets or neighboring properties. Limit vehicle traffic on- and off-site to one route if possible. All access points shall be stabilized with a rock pad construction entrance or other Port-approved BMP. The applicant should consider placing the entrance in the area for future driveway(s), as it may be possible to use the rock as a driveway base material. The entrance(s) must be inspected weekly, at a minimum, to ensure no excess sediment buildup or missing rock.

Applicable BMPs include:

- BMP C105: Stabilized Construction Entrance
- BMP C106: Wheel Wash
- BMP C107: Construction Road/Parking Area Stabilization

The BMP(s) being proposed to meet this element are:

OR

This element is not required for this project because:

Element #3 – Control Flow Rates

Protect properties and waterways downstream of the project site from erosion due to increases in volume, velocity, and peak flow of stormwater runoff from the project site.

Permanent infiltration facilities shall not be used for flow control during construction unless specifically approved by the Environmental Department. Sediment traps can provide flow control for small sites by allowing water to pool and allowing sediment to settle out of the water.

Applicable BMPs include:

- BMP C207: Check Dams
- BMP C240: Sediment Trap

The BMP(s) being proposed to meet this element are:

OR

This element is not required for this project because:

Element 4 – Install Sediment Controls

Surface water runoff from disturbed areas must pass through an appropriate sediment removal device prior to leaving a construction site or discharging into a waterbody. Sediment barriers are typically used to slow stormwater sheet flow and allow the sediment to settle out behind the barrier.

Sediment controls must be installed/constructed prior to site grading.

Applicable BMPs include:

- BMP C208: Triangular Silt Dike
- BMP C232: Gravel Filter Berm
- BMP C233: Silt Fence
- BMP C235: Straw Wattles

The BMP(s) being proposed to meet this element are:

OR

This element is not required for this project because:

Element #5 – Stabilize Soils

Stabilize exposed and unworked soils by applying BMPs that protect the soils from raindrop impact, flowing water, and wind.

From October 1 through April 30, no soils shall remain exposed or unworked for more than 2 days. From May 1 to September 30, no soils shall remain exposed or unworked for more than 7 days. This applies to all soils whether at final grade or not.

Applicable BMPs include:

- BMP C120: Temporary and Permanent Seeding
- BMP C121: Mulching
- BMP C122: Nets and Blankets
- BMP C123: Plastic Covering
- BMP C140: Dust Control

The BMP(s) being proposed to meet this element are:

OR

This element is not required for this project because:

Element #6 – Protect Slopes

Protect slopes by diverting water at the top of the slope. Reduce slope velocities by minimizing the continuous length of the slope.

Applicable BMPs include:

- BMP C200: Interceptor Dike and Swale
- BMP C204: Pipe Slope Drains
- BMP C207: Check Dams

The BMP(s) being proposed to meet this element are:

OR

This element is not required for this project because:

Element #7 – Protect Drain Inlets

All operable storm drain inlets must be protected during construction so that stormwater runoff does not enter the conveyance system without first being filtered or treated to remove sediment. Install catch basin protection on all catch basins within 500 feet downstream of the project.

Applicable BMPs include:

- BMP C220: Storm Drain Inlet Protection

The BMP(s) being proposed to meet this element are:

OR

This element is not required for this project because:

Element #8 – Stabilize Channels and Outlets

Stabilize all temporary onsite conveyance channels. Provide stabilization to prevent erosion of outlets, adjacent stream banks, slopes, and downstream reaches at the conveyance system outlets.

Applicable BMPs include:

- BMP C202: Channel Lining
- BMP C209: Outlet Protection

The BMP(s) being proposed to meet this element are:

OR

This element is not required for this project because:

Element #9 – Control Pollutants

Handle and dispose of all pollutants, including demolition debris and other solid wastes in a manner that does not cause stormwater contamination. Provide cover and containment for all chemicals, liquid products (including paint), petroleum products, and other materials. Handle all concrete and concrete waste appropriately.

Applicable BMPs include:

- BMP C150: Materials on Hand
- BMP C151: Concrete Handling
- BMP C152: Sawcutting and Surface Pollution Prevention
- BMP C153: Material Delivery, Storage and Containment

The BMP(s) being proposed to meet this element are:

OR

This element is not required for this project because:

Element #10 – Control Dewatering

Clean, non-turbid dewatering water, such as groundwater, can be discharged to the stormwater system provided the dewatering flow does not cause erosion or flooding of receiving waters. All other dewatering water shall be pumped to a settling container and taken offsite or discharged to the City sewer system. All discharges to the City sewer system require City approval, which may include a Special Approved Discharge (SAD) permit.

Applicable BMPs include:

- BMP C150: Materials on Hand

The BMP(s) being proposed to meet this element are:

OR

This element is not required for this project because:

Element #11 – Maintain BMPs

Maintain and repair temporary erosion and sediment control BMPs as needed. Inspect all BMPs at least weekly and after every storm event.

Remove all temporary erosion and sediment control BMPs within 30 days after final site stabilization or if the BMP is no longer needed. Any sediment trapped during construction activities should be removed or stabilized onsite. No sediment shall be discharged into the stormwater drainage system or any natural conveyance system (e.g., streams).

Applicable BMPs include:

- BMP C160: Certified Erosion and Sediment Control Lead

The BMP(s) being proposed to meet this element are:

OR

This element is not required for this project because:

Element #12 – Manage the Project

Phase development projects to prevent soil erosion and the transport of sediment from the project site during construction. Coordinate all work prior initial construction with subcontractors and other utilities to ensure no areas are worked prematurely.\

A designated erosion and sediment control person is required for all construction projects. This person is responsible for ensuring that the project’s erosion and sediment control BMPs are appropriate for the site and are functioning properly. They are also responsible for updating the

SWPPP as necessary as site conditions warrant. They must be available 24 hours a day to ensure compliance.

Applicable BMPs include:

- BMP C160: Certified Erosion and Sediment Control Lead
- BMP C162: Scheduling
- BMP C180: Small Project Construction Stormwater Pollution Prevention

The BMP(s) being proposed to meet this element are:

OR

This element is not required for this project because:

Table 1. Applicable BMPs for the 12 Elements of a SWPPP

Element #1 – Mark Clearing Limits		
BMP C101	Preserving Natural Vegetation	
BMP C102	Buffer Zones	
BMP C103	High Visibility Plastic and Wire Fence	
BMP C104	Stake and Wire Fence	
Element #2 – Establish Construction Entrance		
BMP C105	Stabilized Construction Entrance	
BMP C106	Wheel Wash	
BMP C107	Construction Road/Parking Area Stabilization	
Element #3 – Control Flow Rates		
BMP C207	Check Dams	
BMP C240	Sediment Trap	
Element #4 – Install Sediment Controls		
BMP C208	Triangular Silt Trap	
BMP C232	Gravel Filter Berm	
BMP C233	Silt Fence	
BMP C235	Straw Wattles	
Element #5 – Stabilize Soils		
BMP C120	Temporary and Permanent Seeding	
BMP C121	Mulching	
BMP C122	Nets and Blankets	
BMP C123	Plastic Covering	
BMP C140	Dust Control	
Element #6 – Protect Slopes		
BMP C200	Interceptor Dike and Swale	
BMP C204	Pipe Slope Drains	
BMP C207	Check Dams	
Element #7 – Protect Drain Inlets		
BMP C220	Storm Drain Inlet Protection	
Element #8 – Stabilize Channels and Outlets		
BMP C202	Channel Lining	
BMP C209	Outlet Protection	
Element #9 – Control Pollutants		
BMP C150	Materials on Hand	

Element #9 – Control Pollutants, cont.		
BMP C151	Concrete Handling	
BMP C152	Sawcutting and Surfacing Pollution Prevention	
BMP C153	Materials, Delivery, Storage and Containment	
Element #10 – Control Dewatering		
BMP C150	Materials on Hand	
Element #11 – Maintain BMPs		
BMP C160	Certified Erosion and Sediment Control Lead	
Element #12 – Manage the Project		
BMP C160	Certified Erosion and Sediment Control Lead	
BMP C162	Scheduling	
BMP C180	Small Project Construction Stormwater Pollution Prevention	

REFERENCES

City of Tacoma. 2012. Stormwater Management Manual 2012 Edition. Public Works/ Environmental Services, Maintenance Division, Tacoma, Washington.

Washington State Department of Ecology (Ecology). 2005. Stormwater Management Manual for Western Washington. Water Quality Program, Lacey, Washington.

**Port of Tacoma
Terminal 3 & Terminal 4 Shore Power Project**

**Appendix B
Site Development Permit (SDEV21-0278)**



CITY OF TACOMA
 Planning and Development Services
 (253) 591-5030

747 Market St. 3rd Floor
 Tacoma, WA 98402
 Inspections (253) 573-2587

Site Development Permit #SDEV21-0278

Issued Date: 10/21/2021

Expiration Date: 04/19/2022

SITE INFORMATION

Address: 1 SITCUM PLZ

Parcel: 2275200610

PERMIT ISSUED TO

LICENSED CONTRACTOR

PROPERTY OWNER

PORT OF TACOMA
 PO BOX 1837
 TACOMA, WA 98401

NO CONTRACTOR ADDRESS
 FOUND

PORT OF TACOMA
 PO BOX 1837
 TACOMA, WA 98401

PERMIT INFORMATION

Project Description: Underground utility project to install electrical infrastructure for two vessel berths with medium voltage shore to ship power at the POT's Terminals 3 and 4 (Husky Terminal). Installation of electrical power supply elements including cabling/wiring, ship connection boxes/receptacles, vaults, 5kVA power transformers, switchgear, TPU utility service/metering equipment and any necessary trenching and wharf modifications, to provide shore power. Project will provide for 6 vessel connection receptacle locations (3 per vessel berth) over the approximately 3,000-foot-long wharf and will include switchgear equipment at both the north and south ends of the terminal (each fed individually by TPU). The majority of the required cabling will be pulled through existing conduit/infrastructure, however there is a small amount of new conduit/ductbank trenching and a few new vaults requiring trenching and repaving. This project does not impact or change existing stormwater infrastructure.

Permit Fee: \$6,048.90

Project Coordinator: N/A

Related Site Record: N/A

Related Land Use Record: N/A

CONDITIONS OF APPROVAL

Effective immediately until further notice, Governor Inslee's COVID-19 proclamations affect construction activities, and all applicants must review and adhere to the Proclamation 20-25, which is attached to this permit document.

Verify that Stormwater Water Quality infrastructure permitted under SDEV20-0059 is under construction and/or complete prior to close-out of this permit. This project includes replacement of >12,000SF of PGHS that drains to the new infrastructure.

PRINTED PERMIT AND APPROVED PLANS MUST BE KEPT ON SITE DURING CONSTRUCTION

All plumbing, heating, and electrical work will be performed by either the home owner or by a contractor licensed to do the same. Separate permits are required for other work, including but not limited to, sanitary and storm sewer, sidewalk, curb and gutter, driveways, parking lot paving, street improvements, fire protection, and signs. Plumbing and mechanical permits can be incorporated into some permits.

Page 2 of 7



CITY OF TACOMA

Planning and Development Services
(253) 591-5030

747 Market St. 3rd Floor
Tacoma, WA 98402
Inspections (253) 573-2587

Site Development Permit #SDEV21-0278

Issued Date: 10/21/2021

Expiration Date: 04/19/2022

VALUATIONS

Estimated Valuation:

\$7,200,000

PROJECT DETAILS

Company Job ID Number:

201100.01

Night or Weekend Work:

NO



CITY OF TACOMA

Planning and Development Services
(253) 591-5030

747 Market St. 3rd Floor
Tacoma, WA 98402
Inspections (253) 573-2587

Site Development Permit #SDEV21-0278

Issued Date: 10/21/2021

Expiration Date: 04/19/2022

Row

APPROVED REVIEWERS

Category	Approved By	Email	Phone Number
Building Review	Terry Forslund	tforslun@ci.tacoma.wa.us	253-229-2713
Critical Areas Review	John Griffith	jgriffith@cityoftacoma.org	
Critical Areas Review	Lisa Spadoni	lspadoni@cityoftacoma.org	253-377-3310
Fire Protection Review	Chris Seaman	cseaman@cityoftacoma.org	253-591-5503
Flood Hazard Review	Terry Forslund	tforslun@ci.tacoma.wa.us	253-229-2713
Land Use Review	Shirley Schultz	shirley.schultz@cityoftacoma.org	253-345-0879
Real Property Review	Teague Pasco	tpasco@cityoftacoma.org	253-591-5570
Site Development Review	Joy Rodriguez	jrodrigu@cityoftacoma.org	253-312-3513
Tacoma Power Review	Dan Reed	dlreed@cityoftacoma.org	253-502-8292
Tacoma Water Review	Heather Croston	hcroston@cityoftacoma.org	253-331-3830
Traffic Review	Tyler Daniels	tdaniels@cityoftacoma.org	253-591-5554
Water Quality Review	Scott Hallenberg	shallenb@cityoftacoma.org	253-502-8215

GENERAL:

PERMISSION IS HEREBY GIVEN TO DO THE DESCRIBED WORK, AS NOTED ON THE REVERSE SIDE, ACCORDING TO THE CONDITIONS HEREON AND ACCORDING TO THE APPROVED PLANS AND SPECIFICATIONS PERTAINING THERETO, SUBJECT TO COMPLIANCE WITH THE ORDINANCES OF THE CITY OF TACOMA.,

YOUR ATTENTION IS CALLED TO THE FACT THAT IT SHALL BE THE DUTY OF THE PERMITEE (General Contractor) to assure that all necessary inspections are called for and approved by the City Inspectors.

YOUR ATTENTION IS CALLED to the fact that in addition to the called for inspections specified by the applicable codes, the Building Official may make or require any other inspections of any construction work necessary to ascertain compliance with the provisions of City Codes and other laws which are enforced by the City of Tacoma.

YOUR ATTENTION IS CALLED to the fact that in addition to regularly scheduled inspections during construction there shall be a final inspection and approval on all buildings or structures when completed and ready for occupancy. AU required off-site improvements (curbs, sidewalks, storm sewers, etc.) must be completed at time a final inspection and prior to occupancy of building. Construction of off-site improvements requires scheduled inspections during construction in addition to the final inspection.

SPECIAL PERMITS

The holder of Special Permits agrees to the following stipulations:

1. To complete the work encompassed by the Special Permit in accordance with the current edition of the WSDOTIAFWA Standard Specifications as amended by the City of Tacoma General Special Provisions and in accordance with any special provisions or conditions set forth before final acceptance as required by the provisions of the Street Obstruction Bond.
 2. To indemnify and hold the City of Tacoma harmless from any and all damages done to any person or property which may arise from the construction encompassed by the Special Permit.
 3. To submit for review and approval to the Traffic Engineer a traffic control plan developed in accordance with the "Manual on Uniform Traffic Control Devices" (MUTCD). The traffic control plan shall show pedestrian access through the work zone.
 4. To protect the public by placing adequate barricades, signs, cones, lights or other traffic control devices in accordance with the approved traffic control plan. It is understood that traffic lane closures and or sidewalk closures are limited to that which is specifically permitted herein. No other closures will be allowed without prior written approval of the City Engineer.
 5. To provide and maintain protected pedestrian and ADA compliant disability access on walkways at all times.
 6. The City of Tacoma does not guarantee sewer location or depth information. It shall be the permittee's responsibility to verify sewer and sewer stub locations and depths.
 7. To restore Rights-of-Way in accordance with the City's Rights-of-Way Restoration Policy and City of Tacoma Standard Plans
 8. Trench backfill within all improved streets or streets proposed for improvement shall be full depth bank run gravel or approved equal by the Construction Division.
 9. All cuts in arterial streets shall be patched and maintained with Hot Mix Asphalt until permanent repairs are completed. All cuts in residential streets or alleys shall be patched and maintained with cold mix asphalt until permanent repairs are made. Permanent repairs shall be per current City of Tacoma Standard Plans. Streets and alleys shall be permanently repaired within 30 days.
 10. To be responsible for the preservation of any utilities within the construction area.
- CALL TOLL FREE BEFORE YOU DIG -1-800-424-5555 (Utilities Underground Location Center)**
11. 24 Hour notice is required prior to any inspection. Construction Division 253-591-5760, Traffic SignaVStreetlight 253-591-5287.
 12. The Special Permit Expiration date is 30 days from the issue date unless otherwise noted.

9.08.070 Revocation of permits and removal of development.

All permits and/or development granted under the provisions of this chapter may, in any case, be revoked by the Director of

Planning and Development Services, or designee, upon 30 days' notice, or without notice in case any such use or occupation

shall become dangerous or any structure or obstruction permitted shall become insecure or unsafe, or shall not be constructed,

maintained, or used in accordance with the provisions of this chapter. The development shall be removed at the expense of the

permittee and/or adjacent property owner.

If any such structure, obstruction, use, or occupancy is not discontinued on notice to do so by the Director of Planning and

Development Services, the City may forthwith remove such structure or obstruction from such place, or make such repairs

upon such structure or obstruction as may be necessary to render the same secure and safe, at the expense of the permittee or

successor, and such expense, together with the cost of its collection, may be collected in the manner provided by law. As an

alternative, the City may enforce under Title 8.

(Ord. 28501 Ex. A; passed Apr. 10, 2018; Ord. 22865 § 1; passed Jan. 18, 1983; Ord. 21035 § 1; passed Apr. 5, 1977)



STATE OF WASHINGTON
Office of the Governor

MEMORANDUM

TO: Interested Stakeholders

FROM: Governor Jay Inslee

DATE: March 25, 2020

SUBJECT: Construction Guidance - Stay Home, Stay Healthy Proclamation (20-25)

In general, commercial and residential construction is not authorized under the Proclamation because construction is not considered to be an essential activity.

However, an exception to the order allows for construction in the following limited circumstances:

- a) Construction related to essential activities as described in the order;
- b) To further a public purpose related to a public entity or governmental function or facility, including but not limited to publicly financed low-income housing; or
- c) To prevent spoliation and avoid damage or unsafe conditions, and address emergency repairs at both non-essential businesses and residential structures.

To that end, it is permissible for workers who are building, construction superintendents, tradesmen, or tradeswomen, or other trades including, but not limited to, plumbers, electricians, carpenters, laborers, sheet metal, iron workers, masonry, pipe trades, fabricators, heavy equipment and crane operators, finishers, exterminators, pesticide applicators, cleaning and janitorial staff for commercial and governmental properties, security staff, operating engineers, HVAC technicians, painting, moving and relocation services, forestry and arborists, and other service providers to provide services consistent with this guidance.

All construction activity must meet social distancing and appropriate health and worker protection measures

**Port of Tacoma
Terminal 3 & Terminal 4 Shore Power Project**

**Appendix C
Electrical Plan Review (2021-066)
Tacoma Power Approval Letter**

TRANSMISSION & DISTRIBUTION



T&D CORE VALUES: Be Safe • Communicate • Be Accountable • Act Professionally • Act with Integrity • Be Respectful

To: Dimitri Siaterlis **From:** Marshall Swayze

Email: dsiaterlis@elcon.com **Date :** August 25, 2021

Phone: 206-267-3043 **PR #:** 2021-066

Re : POT Terminal 3 Terminal 4 Shore Power **Permit #:** 40000330590

Thank you for the opportunity to review plans for POT Terminal 3 Terminal 4 Shore Power. Although we check the plans for Code compliance with National, State, City and Utility Standards, the main focus of plan review is the load on the electrical system. Plan review is not a substitute for field inspections. Plans are approved contingent on notes below.

Comments:

Plans approved based on an engineer's design and specifications are to be installed meeting the design & standard. Any request to change design or deviate from the engineer's Standard shall be with the engineer's permission. Design changes are to be resubmitted to plan review by the engineer for approval at the inspector and plan review's discretion.

Conductor type not identified on plans are considered to be copper consistent with NEC 110.5

Grounding meeting the requirements of 250.118 and sized per 250.122 and bonding as covered in 250.102 is not part of the plan review process and must be verified during the field inspections.

New or altered services shall be in conformity with the requirements of New Service's Customer Service Policies and the Letter of Agreement when used.

Installation requirements and standards from the utility system to the utility transformer may be found at: http://www.tacomapower.com/construction_standards.htm

Customer requirements and procedures may be found at: <http://www.tacomapower.com/ElectricalPermits/NewServiceHandbook.pdf>

Metering equipment shall match the appropriate EUSERC Drawing for the service size requested.

All equipment must have suitable ratings for the available fault current. Limited energy and telecommunication system are not part of this approval.

Approved plans can be picked up at our inspection counter when a permit for the project is purchased.

Thank you,

Marshall Swayze

Inspector/Electrical Plans Examiner
marshall.swayze@cityoftacoma.org
Phone: 253-396-3301

**Port of Tacoma
Terminal 3 & Terminal 4 Shore Power Project**

**Appendix D
Shoreline Substantial Development
Permit Exemption (LU20-0052)**



City of Tacoma
Planning and Development Services

April 6, 2020

Jennifer Stebbings
Port of Tacoma
P.O. Box 1837
Tacoma, WA 98401

RE: Shoreline Substantial Development Permit Exemption
File No. LU20-0052, Facilities Maintenance, Multiple Sites

Dear Ms. Stebbings:

You have requested an exemption from a Shoreline Substantial Development Permit to allow the repair and maintenance of legally established Port facilities at multiple sites located in the Port of Tacoma, within the "S-10" Port Industrial and "S-13" Waters of the State Shoreline Districts. The maintenance activities received prior approval under a previously issued exemption which has expired (SHR2014-400000237530) and include the following:

- Hanging and bolt-on fender systems and rub strip repair
- Bull rail repairs/maintenance/replacement
- Bollard installation/relocation (includes mooring hardware)
- Utility maintenance (excluding stormwater), including the repair and replacement of electric, domestic water, fire water, communications and warning systems
- Power/Switch gear maintenance, including upgrades and increasing capacity allowed per code
- Crane rail repairs
- Deck repairs including re-planking of dock surfaces (wood)
- Re-surfacing existing impervious areas (paved areas and gravel areas)
- Exterior building repairs and maintenance, including windows, doors, siding, landscaping, roofing, and associated equipment (e.g., HVAC, etc.).
- Containment berm installation and maintenance
- Light pole maintenance
- Safety equipment maintenance, including safety ladders, life rings, and floatation devices and navigation lights
- Safety platform maintenance
- Cathodic protection system repair/maintenance

The majority of the work is anticipated to take place on or from the surface of existing piers and wharves, which are above or adjacent to the waterway and within the floodplain. Work on existing buildings and paved areas will be landward of the OHWM. Exceptions to this include replacement of navigation lights, done from boats, and in-water work such as the installation of cathodic protection systems.

For each maintenance project, best management practices (BMPs) will be used to ensure no deleterious material enters the waters of the state, and will comply with water quality standards and habitat protection standards per the State of Washington. Port of Tacoma employees and/or its contractors will prepare spill prevention plans. Further, following work, each site will be returned to its current state.

Attachment "A" shows the locations of the proposed work.

An exemption from the Substantial Development Permit requirements does not constitute an exemption from the policies and use regulations of the Shoreline Management Act, the provisions of this Master Program, and other applicable City, state, or federal permit requirements. The proposed repairs are consistent with the policies of the Tacoma Shoreline Master Program (TSMP) and the maintenance exemption in TSMP 2.3.3, as they are intended to prevent the cessation of lawfully-established uses.

The sites are located in or adjacent to marine waters and shorelines that are regulated critical areas. The sites have been reviewed in consideration of the critical area policies and regulations of the TSMP and provided the maintenance work adheres to the many BMPs provided, the activities are unlikely to cause substantial adverse impacts to the shoreline environment.

Pursuant to WAC 197-11-800, subsection (3) and the City of Tacoma's SEPA Procedures, this proposed action is categorically exempt from the Threshold Determination and Environmental Impact Statement requirements of SEPA.

Based on the above findings, the requested exemption to the City's Shoreline Substantial Development Permit requirement is consistent with the policies of the SMA, the policies and implementing regulations of the TSMP and with the criteria set forth in the WAC and RCW for the authorization of such exemptions.

The following are conditional **requirements**:

Conditions

1. The applicant shall apply for and receive approval of any required building permit from the City of Tacoma prior to any work.
2. The applicant shall follow all proposed installation and construction methods and best management practices for minimizing unintended impacts during repair and maintenance of all structures.
3. All trash and unauthorized fill, including concrete blocks or pieces, bricks, asphalt, metal, treated wood, glass, floating debris, and paper, below the OHWM in and around the applicant's repair project areas shall be removed and deposited at an approved upland disposal site.
4. No stockpiling or staging of materials will occur below the OHWM of any water body.
5. All shoreline work shall be completed within the approved work windows designated by the Washington State Department of Fish and Wildlife (WDFW).
6. The applicant shall notify the City of Tacoma and pertinent state and federal agencies should an unexpected spill of fuel or other chemicals occur in Commencement Bay or associated waterways.
7. The City of Tacoma is not the only agency with jurisdiction over the project area. The applicant is responsible for coordinating any required reviews and/or approvals with the

WDFW, Washington State Department of Ecology, and U. S. Army Corps of Engineers and shall provide documentation to the City of Tacoma.

8. This exemption shall be valid for a period not to exceed 5 years from the date of issuance. Should the Shoreline Master Program be revised prior to the completion of this project, additional review may be required.

In addition, the applicant is advised of the following:

- This permit is only applicable to the proposed project as described above and based upon the information submitted by the applicant. Modifications to this proposal and future activities or development within the regulated buffers may be subject to further review and additional permits as required in accordance with the *Tacoma Municipal Code*.
- The applicant must obtain other approvals prior to construction as required by other local, state and federal agencies. The City of Tacoma is not the only reviewing agency with jurisdiction over the project area. The Army Corps of Engineers and State Department of Fish and Wildlife have requirements regarding work within regulated waters that may be applicable to the project.
- This exemption is applicable only to areas within 200 feet of the OHWM of waters of the state. It is not meant to constitute an exemption from *TMC*13.11 Critical Areas. Should work outside the Shoreline jurisdiction occur within vicinity of a non-associated critical area, additional review may be required.

We are issuing this letter of exemption per the provisions of *TMC* Section 13.10 to comply with the requirements of *WAC* 173-27-050 and *WAC* 173-27-040. Should you have any further questions or requests please do not hesitate to contact me at 253-591-5121.

Sincerely,



Shannon Brenner
Environmental Specialist

cc via regular and electronic mail:

Washington Department of Ecology, Shorelands & Environmental Assistance Program, Zach Meyer, SWRO, P.O. Box 47775, Olympia, WA 98504-7775 (zmey461@ecy.wa.gov)
Washington Department of Fish and Wildlife, Elizabeth Bockstiegel, 600 Capitol Way N., Olympia, WA 98501-1091(elizabeth.bockstiegel@dfw.wa.gov)
U.S. Army Corps of Engineers, Attn: Regulatory Branch, CENWS-OD-RG Attn: Halie Endicott, P.O. Box C-3755, Seattle, WA 98124 (halie.endicott@usace.army.mil)
U.S. Fish & Wildlife Service, Attn: Judy Lantor, 510 Desmond Drive SE #102, Lacey, WA 98503 (jusdy_lantor@fws.gov)



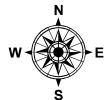
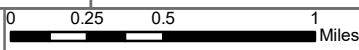
FIGURE 1 - Vicinity Map

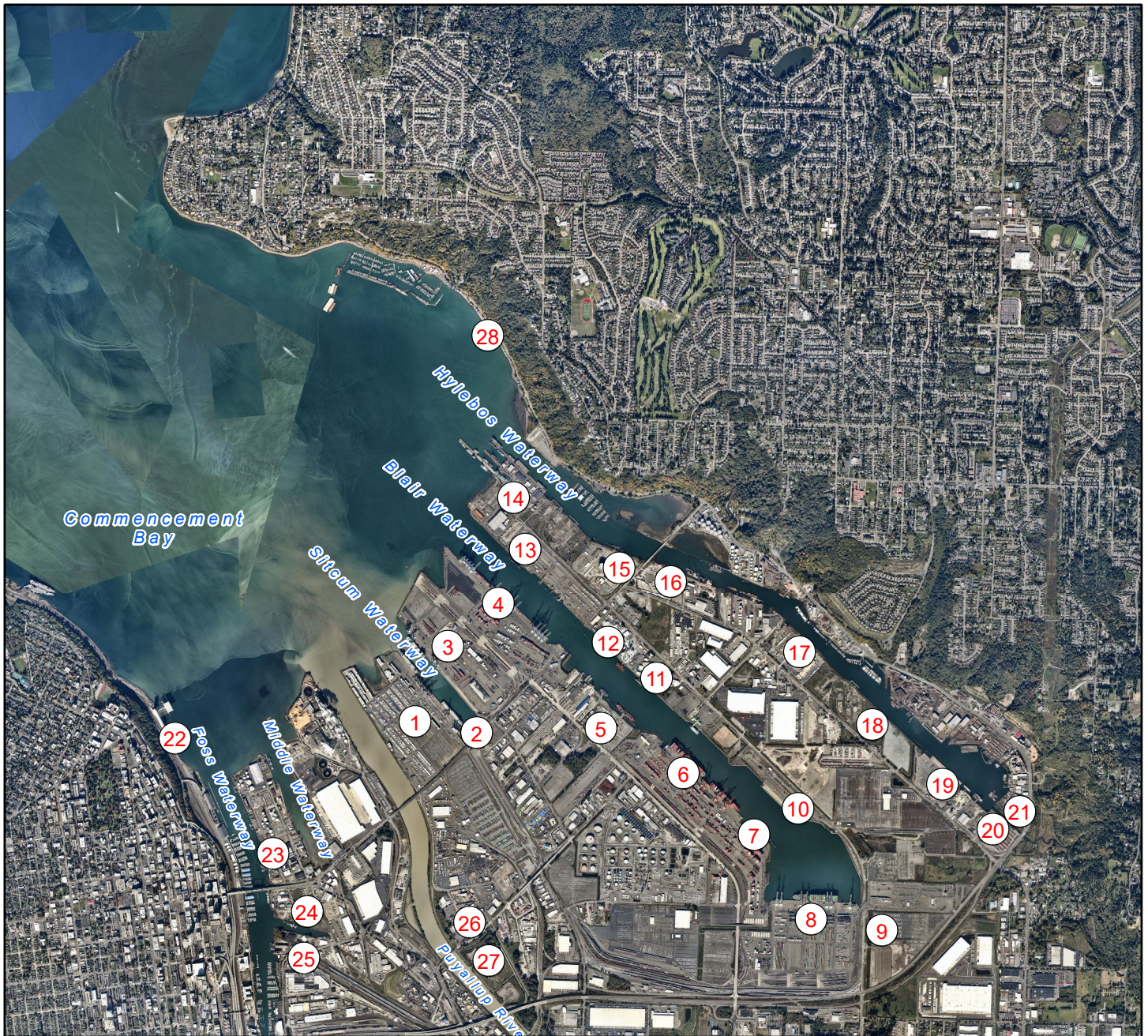
REFERENCE: NWS-2014-1149-WRD
PROJECT: Port-wide Maintenance
APPLICANT: Port of Tacoma
LOCATION: Tacoma, WA

IN: Commencement Bay
NEAR: Tacoma
COUNTY: Pierce
STATE: Washington

- ADJACENT LANDOWNERS:**
1. Puyallup Tribe of Indians
 2. City of Tacoma
 3. WSDOT
 4. Private Landowners

SHEET: 1 OF 6
DATE: 2/11/2020
AUTHOR: Jenn Stebbings





1 WEST SITCUM TERMINAL	8 PCT	15 PSE	22 TEMCO
2 PORT ADMIN BLDG	9 PARCEL 15	16 STEAMPLANT	23 YOUTH MARINE
3 TERMINAL 7 A-D	10 EB-1	17 CARLILE	24 WATTLES
4 HUSKY TERMINAL	11 GP GYPSUM	18 PARCEL 99	25 PARCEL 92
5 PARCEL 125	12 PARCEL 115	19 PARCEL 105	26 2002 STEWART
6 WUT	13 TOTE	20 PARCEL 86	27 GOG-LE-HI-TE
7 BLAIR DOCK	14 TRIDENT/EBC	21 CALBAG	28 D.G. KAYAK LAUNCH

FIGURE 02

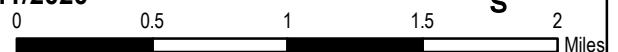
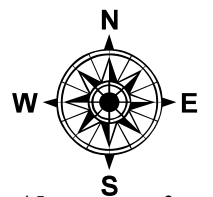


PO Box 1837 Tacoma, WA 98401 (253) 383-5841

REFERENCE #: NWS-2014-1149-WRD
 APPLICANT NAME: Port of Tacoma
 PROJECT: Programmatic Port-wide Maintenance
 LOCATION: Tacoma, WA

SHEET 2 of 6

DATE: 02/11/2020



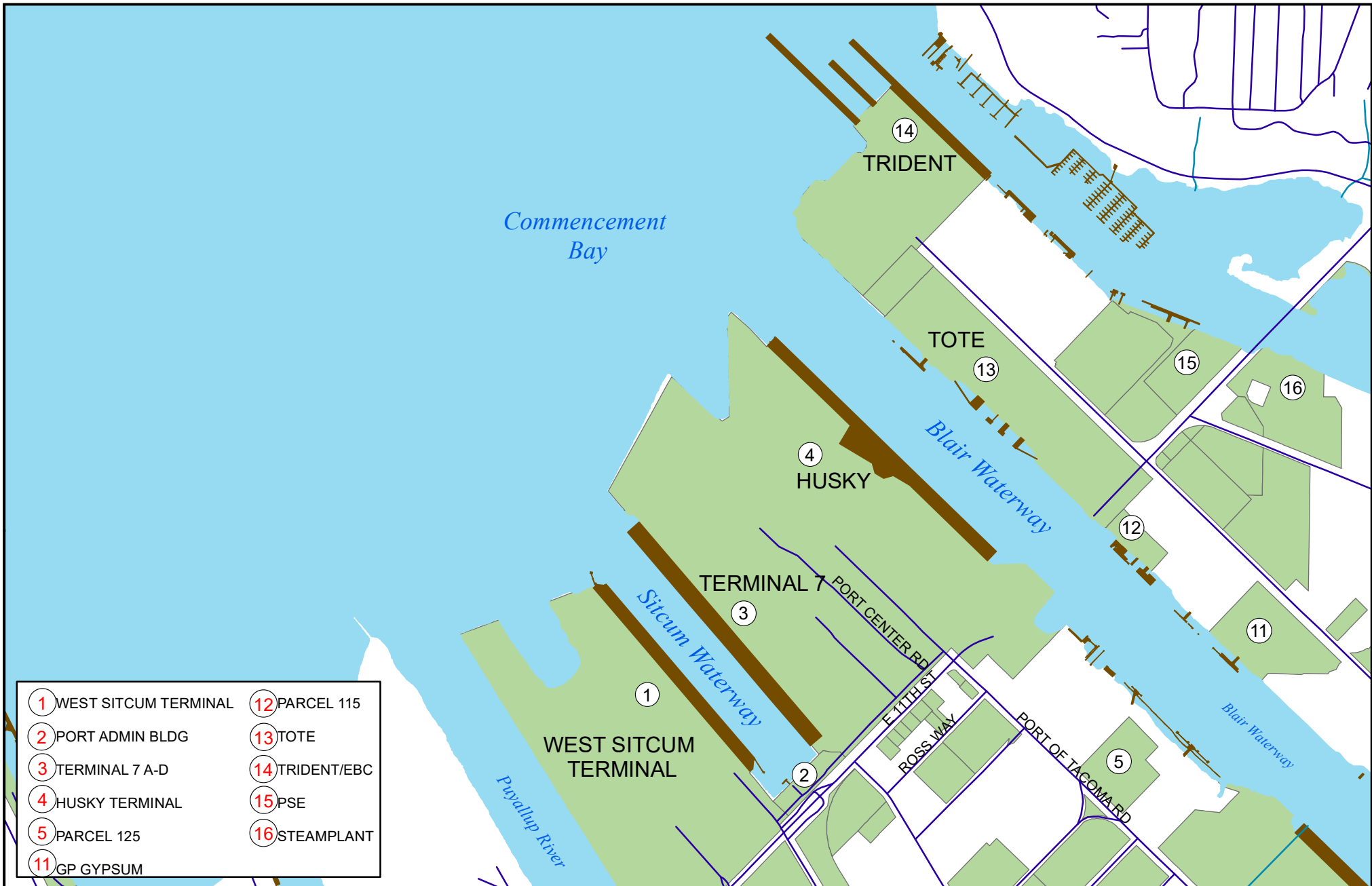
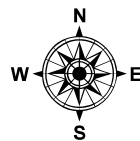



FIGURE 03
REFERENCE #: NWS-2014-1149-WRD
APPLICANT NAME: Port of Tacoma
PROJECT: Programmatic Port-wide Maintenance
LOCATION: Tacoma, WA



-  Roads
-  Creek
-  Piers
-  Waterways
-  PortParcels

0 500 1,000
 Feet

Author: Jenn Stebbings



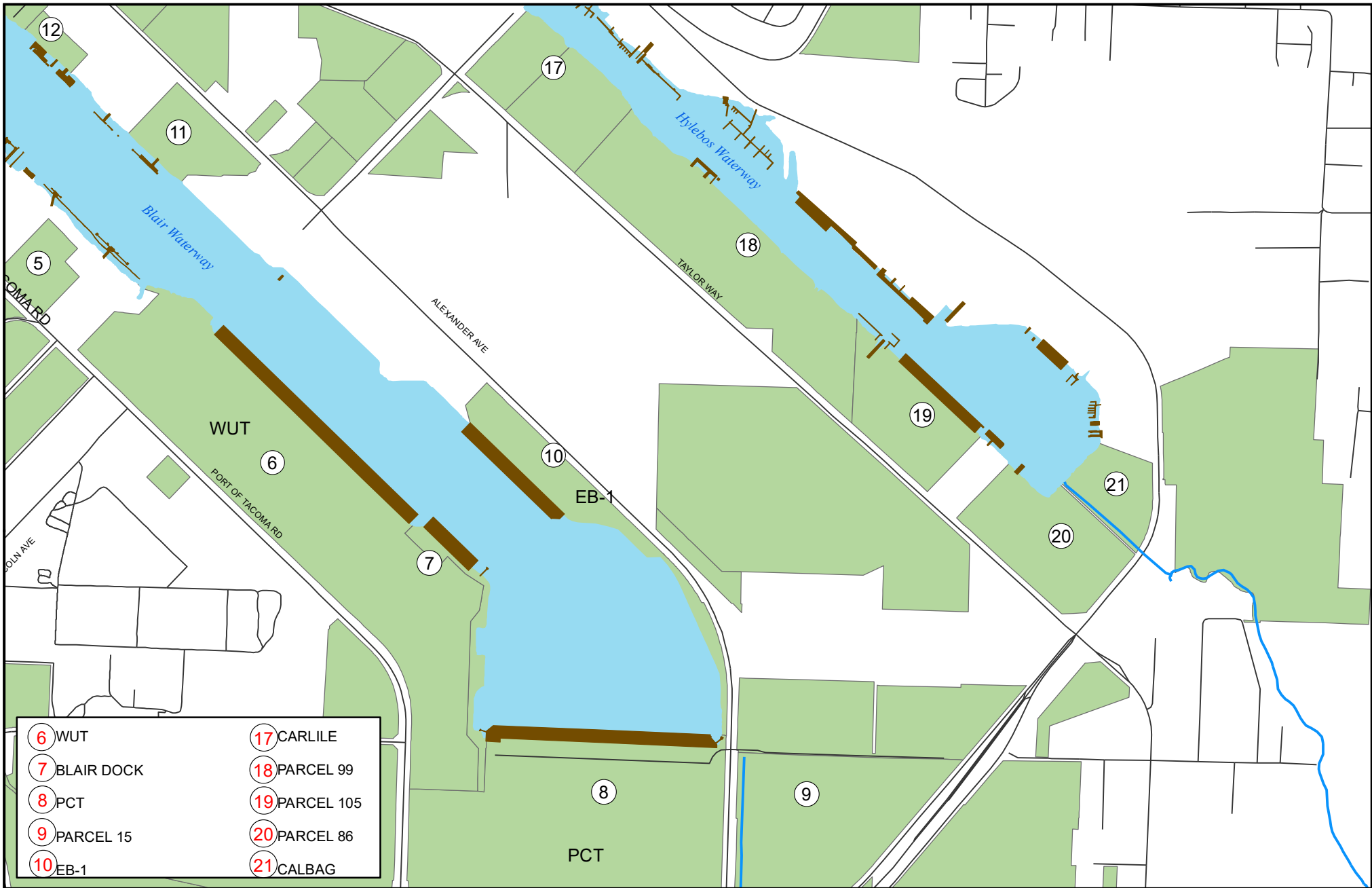
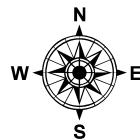
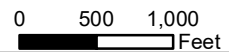


FIGURE 04
REFERENCE #: NWS-2014-1149-WRD
APPLICANT NAME: Port of Tacoma
PROJECT: Programmatic Port-wide Maintenance
LOCATION: Tacoma, WA



- Creek
- Roads
- Piers
- Waterways
- PortParcels

DISCLAIMER: The information included on this map has been compiled by Port of Tacoma staff from a variety of sources and is subject to change without notice. These data are intended for informational purposes and should not be considered authoritative for engineering, navigational, legal and other site-specific uses. The Port of Tacoma makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information.

Author: Jenn Stebbings

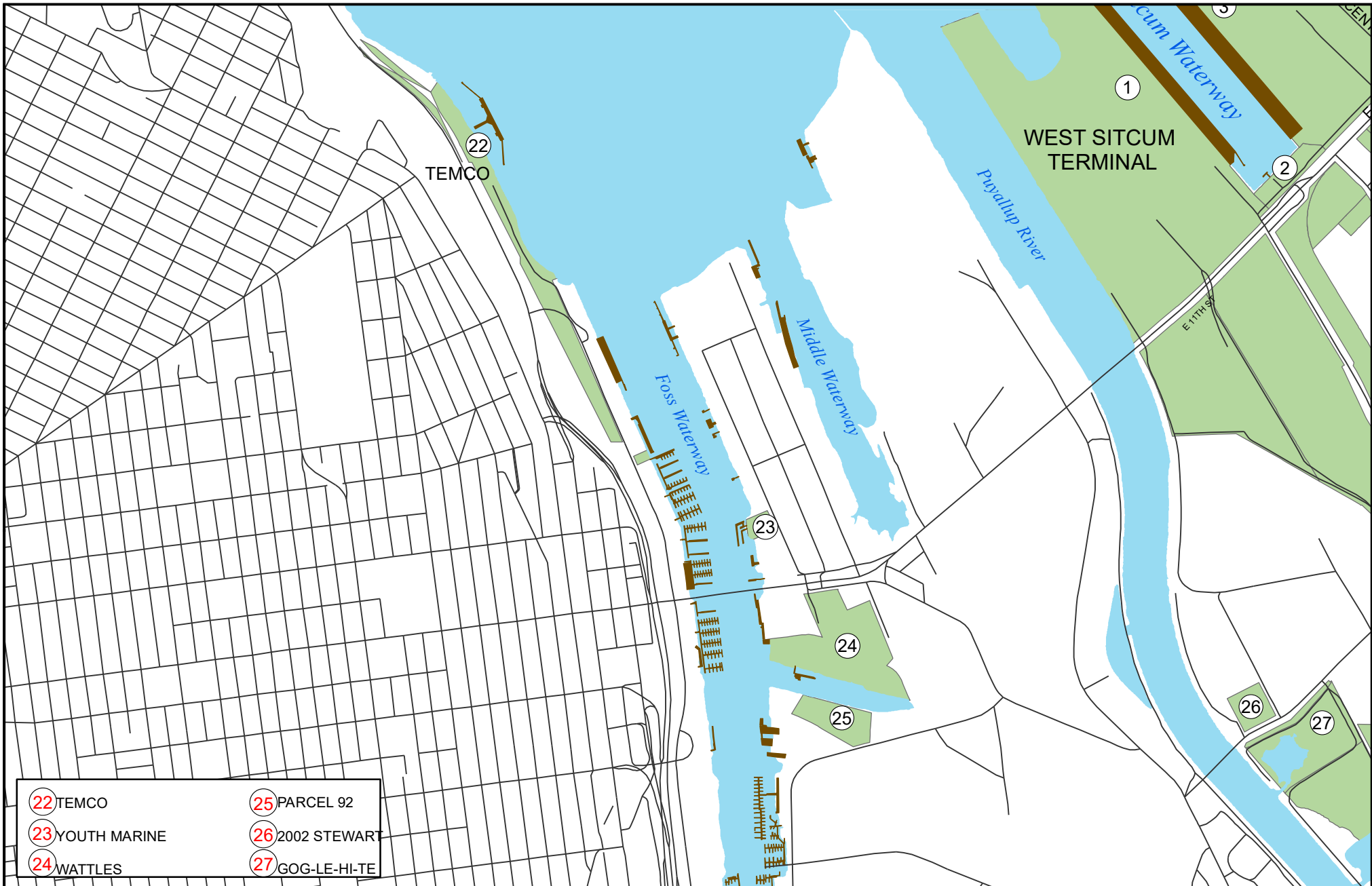
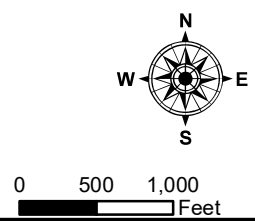


FIGURE 05
REFERENCE #: NWS-2014-1149-WRD
APPLICANT NAME: Port of Tacoma
PROJECT: Programmatic Port-wide Maintenance
LOCATION: Tacoma, WA



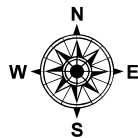
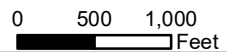
- Creek
- Roads
- Piers
- Waterways
- PortParcels

DISCLAIMER: The information included on this map has been compiled by Port of Tacoma staff from a variety of sources and is subject to change without notice. These data are intended for informational purposes and should not be considered authoritative for engineering, navigational, legal and other site-specific uses. The Port of Tacoma makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information .
 Author: Jenn Stebbings





FIGURE 06
REFERENCE #: NWS-2014-1149-WRD
APPLICANT NAME: Port of Tacoma
PROJECT: Programmatic Port-wide Maintenance
LOCATION: Tacoma, WA



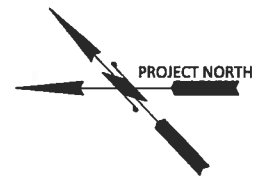
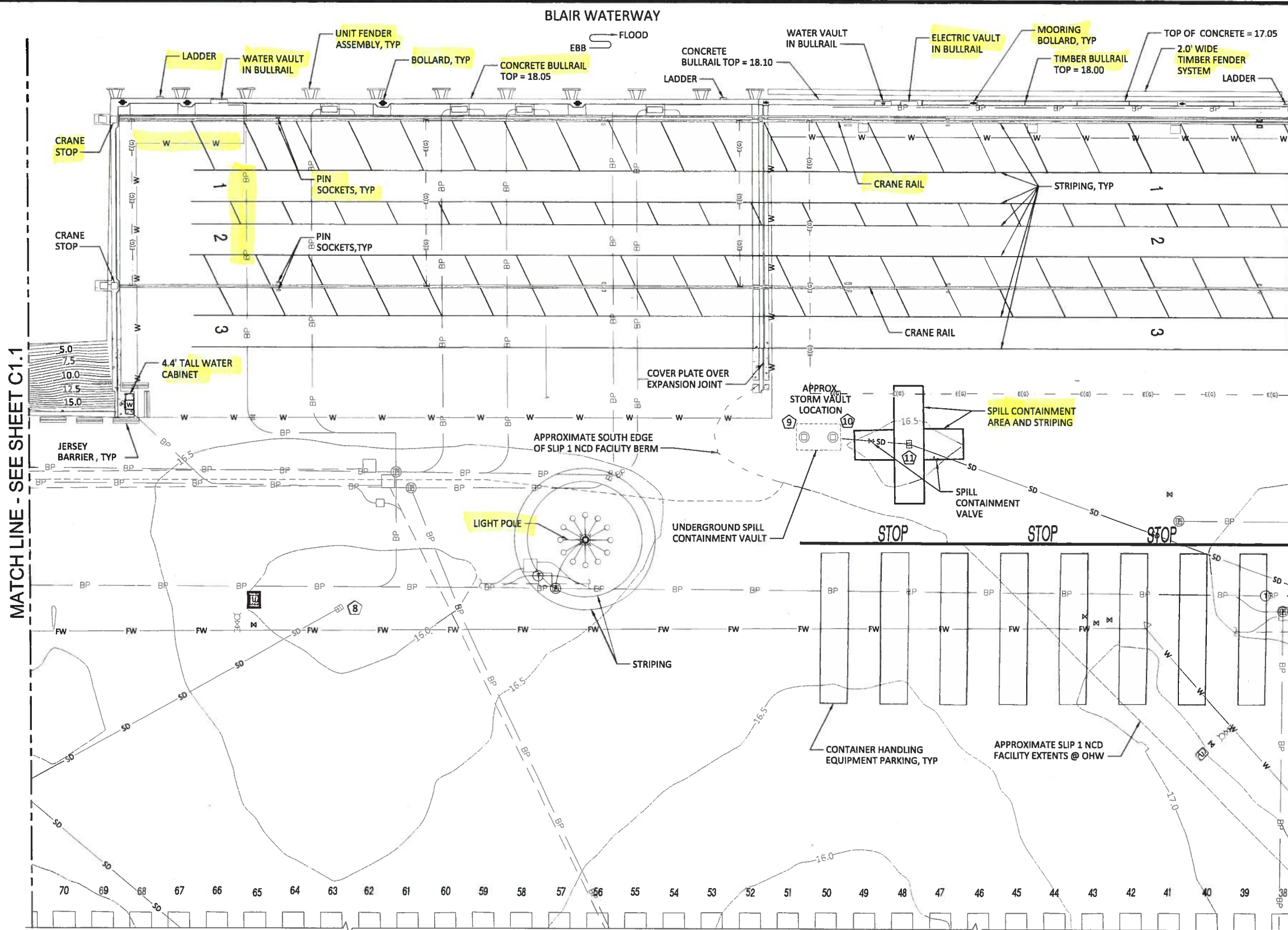
- Piers
- PortParcels
- Creek
- Roads
- Waterways
- PortParcels

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Author: Jenn Stebbings

BINDING EDGE

Last Saved by: Jason.mendenhall on: Jun 6, 2013 3:58 PM File: C:\Federal\May2012\PAWA1-12-09\1\CAADD\DWG\02_C01-04.dwg



LEGEND

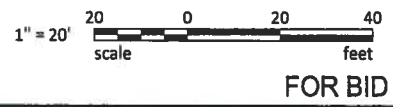
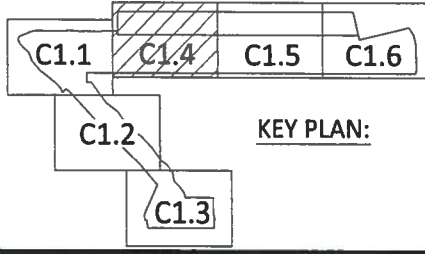
- PROJECT CONTROL POINT
- MOORING BOLLARD
- STORMWATER MANHOLE
- STORMWATER CATCH BASIN
- STORMWATER YARD DRAIN
- STORMWATER CULVERT
- SANITARY SEWER MANHOLE
- SANITARY SEWER CLEANOUT
- WATER VAULT
- WATER METER
- WATER VALVE
- FIRE HYDRANT
- IRRIGATION CONTROL VALVE
- UTILITY POLE
- LIGHT POLE
- POWER MANHOLE
- POWER VAULT
- PAD MOUNTED TRANSFORMER
- POWER JUNCTION BOX
- POWER PANEL
- TELEPHONE/COMM MANHOLE
- TELEPHONE/COMM VAULT
- UNKNOWN UTILITY VAULT
- CAMERA SENSOR POLE
- SIGN
- PIPE BOLLARD
- CONCRETE
- STORMWATER DRAIN LINE
- SANITARY SEWER LINE
- WATER LINE
- FIRE WATER LINE
- ELECTRIC LINE
- COMMUNICATIONS LINE
- ELECTRICAL GROUND
- CHAIN LINK FENCE
- MAJOR CONTOUR
- MINOR CONTOUR
- SPOT ELEVATION
- STORM STRUCTURE IDENTIFICATION NUMBER
- STRIPING ON ASPHALT

MATCH LINE - SEE SHEET C1.1

MATCH LINE - SEE SHEET C1.5

Terminal and Shoreline Area Maintenance and Repair. Highlighted items are examples of what activities are included in the permit application.

1 PLAN - EXISTING CONDITIONS
SCALE: 1" = 20'



BergerABAM
33301 9th Avenue South, Suite 300
Federal Way, Washington 98003-2000
(206) 937-2300 Fax: (206) 937-2350

Port of Tacoma
P.O. BOX 187 TACOMA, WA 98402-0187

DATE: _____
APPR: _____
BY: _____
REVISION: _____

6/7/13
6/7/13
6/7/13

CSB CHECKED BY DATE
JRG 6/7/13

DIR OF ENG DATE PROJ. ENGR DATE
jason.mendenhall 6/7/13

PRINTED BY: jason.mendenhall
PORT ADDRESS: ONE SITCUM WAY TACOMA, WA 98421-2300

APPROVED: *[Signature]*

PIER 3 UPGRADE
EXISTING CONDITION PLAN
SHEET 4

TOWNSHIP: 21 N RANGE: 3 E SECTION: 27
DATE-HR: 2: NAD 83-07 VERT: NOS TIDAL (MLW = 0.0)
PARCEL: 27 DRAWING SCALE: AS SHOWN

6502
SHEET 11 OF 123
C1.4
CONT/CONS: 069458
MASTER ID NO: 092935
PHASE: FOR BID

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**Port of Tacoma
Terminal 3 & Terminal 4 Shore Power Project**

**Appendix E
SEPA Exemption**

MEMORANDUM

DATE: November 20, 2014
TO: Port of Tacoma SEPA File
FROM: Jennifer Stebbings
SUBJECT: SEPA Exemption Terminal and Shoreline Area Routine Maintenance and Repair

The Port of Tacoma (Port) currently owns multiple properties that require regular maintenance and repair to ensure a safe and efficient operation. The project sites are located on Port properties throughout the Tacoma Tideflats. All properties are zoned S-10 Port Industrial.

The project includes routine maintenance and repair work that will occur over a five year period commencing once the Port receives all necessary approvals, which may include a Nationwide 3 permit from the U.S. Army Corps of Engineers, a Hydraulic Project Approval from the Washington State Department of Fish and Wildlife, and a formal exemption letter from the City of Tacoma covering both Shoreline and Critical Area requirements.

The routine maintenance and repair activities apply to the following typical Port infrastructure: hanging and bolt-on fender systems and rub strips; bull rails; bollards; utilities (excluding stormwater infrastructure); power/gear switches; crane rails; dock surfaces (planks, pavement); other existing paved and impervious surfaces; building exteriors; containment berms; light poles; safety equipment and platforms; navigation lights; and cathodic protection systems. The following routine maintenance and repair activities are needed to maintain the integrity of Port infrastructure and to operate safely and efficiently.

Hanging and bolt-on fender systems and rub strip repair: Work will occur from existing piers located above and adjacent to marine waters and in the 100-year floodplain. To replace the fenders and rub strips, a derrick is maneuvered as close as possible to the wingwall where it holds the replacement fender or rub strip while the bolts are removed by hand. The original fender or rub strip is then lowered and loaded onto a barge or truck and removed from the site. The replacement fender or rub strip is then held and bolted into place.

Bull rail repairs/maintenance: Work will occur from existing piers located above and adjacent to marine waters and in the 100-year floodplain. No parts of the bull rail are in contact with the water. The bull rail and decking are generally installed manually using hand tools from the dock surface. However, on occasion, it will be necessary to use a forklift or backhoe to remove heavy sections.

Bollard installation/relocation (includes mooring hardware): Work will occur from existing piers located above and adjacent to marine waters and in the 100-year floodplain. The concrete of the bull rail and pile cap will be chipped away to expose the rebar, and holes will be drilled in the broken concrete surface. Dowels will be epoxied into the holes to provide solid anchoring points for the new concrete to help integrate the old and the new as one structure. The new bollard will be placed in position and integrated into the existing rebar and concrete and the pour will be formed up, then the new concrete will be poured and finished.

Utility maintenance (excluding stormwater): Work can occur from existing piers located above and adjacent to marine waters and within the 100-year floodplain. Maintenance in areas landward of the Ordinary High Water Mark (OHWM) may include trenching, backfilling and repaving.

Repair or replacement of underground utilities will require existing pavement to be saw cut and removed for trenching. Trenching will remove the subgrade material to allow access to the existing utilities. Once repairs are complete the trench will be backfilled with excavated material or new clean imported material. All excavated material not used will be stockpiled for testing and proper disposal offsite. Repaving will be conducted to match the existing surface, grade, and asphalt thickness.

Maintenance and repair of electrical equipment will be conducted based on the associated building and common industrial standard.

Warning system equipment maintenance and repair includes work on speaker arrays, strobes, and control cabinets that are located on poles in upland locations.

Power/Switch gear maintenance: Work may occur from existing piers located above and adjacent to marine waters and within the 100-year floodplain.

Maintenance and repair of electrical equipment will be conducted based on the associated building and common industrial standard.

Crane rail repairs: Work will occur from existing paved wharfs located above and adjacent to marine waters and within the 100-year floodplain. All work will occur from the surface of the existing paved wharf.

Deck repairs including re-planking of dock surfaces (wood): Work will occur above and adjacent to marine waters and within the 100-year floodplain. Specifically, deteriorated timber planks will be removed and replaced with new timber planks. No in-water work will occur; all equipment will be positioned on the dock itself; and no increase in footprint or overwater coverage is proposed.

The deteriorated timber will be removed by cutting with a chainsaw and lifting out either by hand or with a truck-mounted davit. Due to the severe constraints beneath the dock, the Port will not be able to employ work floats or tarps to capture falling debris; however, workers will operate a vacuum while using power tools to cut decking, and skim any debris that may escape the vacuum to minimize impacts to the waterbody. Replacement timbers will be installed using hand tools.

Re-paving existing paved areas: Work will occur landward of the OHWM and may occur within the 100-year floodplain. The old surface will be milled away. An application of a tack coat will be applied and a new layer asphalt will then be laid down with paving machines and rollers.

Exterior building repairs and maintenance: Work will occur above and adjacent to marine waters and within the 100-year floodplain. Maintenance and repair work will be conducted from improved areas surrounding existing buildings. Typical equipment may include lifts, scaffolding, and trucks. Landscaping maintenance is limited to the immediate area surrounding buildings and parking areas that are not part of a restoration, mitigation, or other area that is not already regularly maintained.

Containment berm installation and maintenance: Work will occur landward of the OHWM and may occur within the 100-year floodplain. Typical equipment used to construct a containment berm includes trucks and paving equipment.

Light pole maintenance: Work will occur above and adjacent to marine waters and within the 100-year floodplain. Typical equipment will include lifts and trucks.

Maintenance of safety equipment: Work will occur above and adjacent to marine waters and within the 100-year floodplain. Safety equipment will be installed using hand tools on the dock surface or with the use of a boom truck operated from the dock or a barge. Workers will operate a vacuum while using power tools to cut decking in over water areas and skim any debris that may escape the vacuum to minimize waterbody impacts.

Safety ladders are approximately 30 feet long and 24 inches wide and are mounted to the face of the wharf or pier (please see Figure 1 for standard dimensions). Life rings and their housing are approximately 2 feet by 2 feet and are mounted to the top of the wharf or pier.

Navigation light maintenance and replacement: Work will occur above and adjacent to marine waters and within the 100-year floodplain. Navigation lights will be accessed by boat and replaced with hand tools.

Safety platform maintenance: Work will occur above and adjacent to marine waters and within the 100-year floodplain. Line platforms will be accessed from the pier and will be maintained with hand tools and/or use of a boom truck operated from the pier.

Cathodic protection system repair/maintenance: Work will occur within the 100 year floodplain above and in marine waters. Repair and maintenance will be done with hand tools from a floating work platform and/or by divers.

The Port of Tacoma will ensure that the maintenance activities do not harm wildlife, vegetation or other elements of the shoreline environment. In addition to the following BMPs, the maintenance activities will be designed to comply with applicable federal, state and local laws and regulations to avoid and minimize adverse impacts to the aquatic environment.

The following BMPs apply to all maintenance activities:

- Each activity will comply with the Washington Department of Fish and Wildlife Hydraulic Project Approval requirements including timing restrictions to protect juvenile salmonid migration.
- Each activity will comply with water quality restrictions imposed by the Washington Department of Ecology and implement corrective measures if water quality standards are exceeded.
- If a contractor performs the maintenance activities, they will be required to prepare a Spill Prevention, Control and Countermeasures plan (SPCC). The SPCC plan will describe how the contractor will store all fuels and hazardous substances that may be onsite during construction. It will include procedures that the contractor will follow in the event of a fuel or chemical spill, and will require the contractor to have a spill response kit that will prevent spilled material from entering surface waters. The plan will also include emergency phone numbers and contacts that will be made in the event of a spill.
- No petroleum products, hydraulic fluids, chemicals, or any other polluting substances shall be allowed to enter waters of the state.
- Fuel hoses, oil drums, oil or fuel transfer valves and fittings, etc., will be checked regularly for drips or leaks, and shall be maintained and stored properly with secondary containment to prevent spills.
- Once the activity is complete, all temporary work structures, devices, equipment, materials, man-made debris and wastes from the project shall be completely removed from the shoreline.
- Temporary floating work platforms will not disturb eelgrass, kelp, and/or intertidal wetland vascular plants.
- Work that could result in debris and substances entering waters of the state shall include a containment structure capable of collecting all debris and substances. Where space or worker safety constraints preclude the use of such structures, workers will operate a vacuum

while using power tools to cut or drill, and will skim any debris that may escape the vacuum to minimize waterbody impacts.

- No stockpiling or staging of materials will occur waterward of the OHWM of any waterbody, except for when work is occurring on a paved wharf/pier. Stockpiles will be covered with plastic to prevent contact with the elements and erosion.
- All areas for equipment fuel storage will be located 150 feet from open water or wetlands.
- Fueling and servicing of all equipment will be confined to an established staging area that is at least 150 feet from open water or wetlands.
- A spill kit with oil-absorbent materials is on site to be used in the event of a spill.
- Deck and storm drain inlets will be protected to prevent sediment and contaminants from entering the waterways or storm drain system.
- Proper BMPs such as a silt fence and/or straw wattles will be used to provide a physical barrier to sediment and prevent runoff.

BMPs specific to the maintenance activity include, but are not limited to:

Hanging and bolt-on fender systems and rub strip repair

- A small barge, wood and/or cloth barrier will be used to catch debris to prevent it from falling into the water.

Bull rail repairs/maintenance

- A small barge, wood and/or cloth barrier will be used to catch debris to prevent it from falling into the water.

Bollard installation/relocation (includes mooring hardware)

- Stormwater BMPs will be in place to ensure that concrete dust is not carried through the deck drains on the wharf/pier, and to ensure that stormwater does not contact wet or fresh concrete.
- A small barge, wood and/or cloth barrier will be used to catch the concrete as it is chipped to prevent it from falling into the water.
- Concrete forms will be completely sealed on the bottom and sides to prevent wet concrete from escaping and dropping into the water.
- Washwater and leftover concrete product will not be allowed to drain onto the deck or into storm drains or allowed to drain to waters of the state.

Utility maintenance (excluding stormwater)

- Work that could result in debris and substances entering waters of the state shall include a containment structure capable of collecting all debris and substances.
- Stormwater BMPs will be in place to ensure that concrete dust is not carried through the deck drains on the pier/wharf, and to ensure that stormwater does not contact wet or fresh concrete.
- Slurry, cuttings, or process water will not be allowed to drain to waters of the state or stormwater conveyance systems.

Power/Switch gear maintenance

- Stormwater BMPs will be in place to ensure that concrete dust is not carried through the deck drains on the pier/wharf, and to ensure that stormwater does not contact wet or fresh concrete.
- Washwater and leftover concrete product will not be allowed to drain onto the deck or into storm drains or allowed to drain to waters of the state.

Crane rail repairs

- Work that could result in debris and substances entering waters of the state shall include a containment structure capable of collecting all debris and substances.
- Stormwater BMPs will be in place to ensure that concrete dust is not carried through the deck drains on the pier/wharf, and to ensure that stormwater does not contact wet or fresh concrete.
- Slurry, cuttings, or process water will not be allowed to drain to waters of the state or stormwater conveyance systems.
- Concrete forms will be completely sealed on the bottom and sides to prevent wet concrete from escaping and dropping into the water.
- Washwater and leftover concrete product will not be allowed to drain to deck or storm drains or allowed to drain to waters of the state.

Deck repairs including re-planking of dock surfaces (wood)

- Work floats or tarps will be used to capture any falling debris to prevent any material from entering the waterway. Where such space or worker safety constraints preclude the use of such structures, workers will operate a vacuum while using power tools to cut or drill, and will skim any debris that may escape the vacuum to minimize waterbody impacts.
- Excess or waste materials will not be allowed to enter waters of the state. All such materials will be collected and recycled or disposed of at an approved upland facility.
- Wood treated with creosote or pentachlorophenol will not be used.
- Any deck overlay removal and/or replacement must have a sound subsurface that will prevent existing or new overlay material from entering waters of the state.

Re-paving existing paved areas

- Slurry, cuttings, or process water will not be allowed to drain to waters of the state or stormwater conveyance systems.
- Washwater and leftover concrete product will not be allowed to drain to deck or storm drains or allowed to drain to waters of the state.

Exterior building repairs and maintenance

- Slurry, cuttings, or process water will not be allowed to drain to waters of the state or stormwater conveyance systems.
- Work that could result in debris and substances entering state water shall include a containment structure capable of collecting all debris and substances.

Containment berm installation and maintenance

- Slurry, cuttings, or process water will not be allowed to drain to waters of the state or stormwater conveyance systems.

Light pole maintenance

- Slurry, cuttings, or process water will not be allowed to drain to waters of the state or stormwater conveyance systems.

Safety equipment installation/relocation (ladders, flotation devices, etc.)

- A small barge, wood and/or cloth barrier will be used to catch debris to prevent it from falling into the water.

Navigation light maintenance and replacement

- Work that could result in debris and substances entering waters of the state shall include a containment structure capable of collecting all debris and substances.

Safety platform maintenance

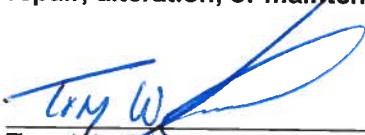
- A small barge, wood and/or cloth barrier will be used to catch debris to prevent it from falling into the water.

Cathodic protection system repair/maintenance

Work that could result in debris and substances entering waters of the state shall include a containment structure capable of collecting all debris and substances.

SEPA Finding: The Port of Tacoma, as lead agency, has determined that there is no establishment, change, or material expansion in use for the project and it is categorically exempt from SEPA review based on the criteria described in WAC 197-11-800(3).

WAC 197-11-800(3): Repair, remodeling and maintenance activities—The following activities shall be categorically exempt: The repair, remodeling, maintenance, or minor alteration of existing private or public structures, facilities or equipment, including utilities, involving no material expansions or changes beyond that previously existing; except that, where undertaken wholly or in part on lands covered by water, only minor repair or replacement of structures may be exempt (examples include repair or replacement of pilings, ramps, floats, or mooring buoys, or minor repair, alteration, or maintenance of docks.



Tony Warfield
Senior Environmental Project Manager

11/25/14
Date

**Port of Tacoma
Terminal 3 & Terminal 4 Shore Power Project**

**Appendix F
Inadvertent Discovery Plan**



PUYALLUP TRIBE OF INDIANS
DEVELOPMENT & CONSTRUCTION PERMIT APPLICATION



INADVERTENT DISCOVERY PLAN

(Cultural Resources Investigation Information methods/Results) In the event that cultural resources are encountered during construction-related activities, this document serves as the plan for dealing with the inadvertent discoveries of human remains, artifacts, sites, or any other cultural resources during the project.

- Pier 3/4 Shorepower Project, Port of Tacoma
- Attachment A provides project description and contacts.

Instructions: Please insert responsible official in blanks.

This plan will provide the Puyallup Tribe of Indians (PTOI) employees, _____ Port of Tacoma (Port) _____ and any involved contractors and their employees with the appropriate protocols and procedures so they can:

- Utilize as guidance for treatment, Chapter 27.44 Indian Graves and Records, Chapter 27.53 Archaeological Sites and Resources, and Chapter 68.60 Section 68.60.050 Protection of Historic Graves of the Revised Code of Washington (RCW);
- Describe to regulatory and review agencies the procedures the PTOI and Port of Tacoma will follow to prepare for and deal with inadvertent discoveries; and,
- Understand and follow the procedures and protocols established in this document should an inadvertent discovery occur.

Procedures for the Discovery of Cultural Resources

1. If any PTOI or Port employee, contractors or subcontractors suspects the inadvertent discovery of a cultural resource, all ground disturbing, construction or other activities around the immediate area of the discovery shall cease. A cultural resource may include an archaeological or historical resource.

An **archaeological resource** is defined in RCW 27.53.040 as:

All sites, objects, structures, artifacts, implements, and locations of prehistoric or archaeological interest, whether previously recorded or still unrecognized, including, but not limited to, those pertaining to prehistoric and historic American Indian or aboriginal burials, campsites, dwellings, and habitation sites, including rock shelters and caves, their artifacts and implements of culture such as projectile points, arrowheads, skeletal remains, grave goods, basketry, pestles, mauls and grinding stones, knives, scrapers, rock carvings and paintings, and other implements and artifacts of any material that are located in, on, or under the surface of any



PUYALLUP TRIBE OF INDIANS
DEVELOPMENT & CONSTRUCTION PERMIT APPLICATION



lands or waters owned by or under the possession, custody, or control of the state of Washington or any county, city, or political subdivision of the state are hereby declared to be archaeological resources.

A **historical resource** is defined in RCW 27.53.030 (11):

. . .mean[ing] those properties which are listed in or eligible for listing in the Washington State Register of Historic Places (Washington Heritage Register [WHR]) (RCW 27.34.220) or the National Register of Historic Places (NRHP) as defined in the National Historic Preservation Act of 1966 (Title 1, Sec. 101, Public Law 89-665; 80 Stat. 915; 16 U.S.C. Sec. 470) as now or hereafter amended. Cultural resources may qualify for the WHR and/or the NRHP listing if they are intact, aged at least 50 years old, and at least one of the following:

- Are associated with events that have made a significant contribution to the broad patterns of our history; or
- Are associated with the lives of persons significant in our past; or Embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- Have yielded, or may be likely to yield, information important in prehistory or history.

2. Upon discovery of a cultural resource, Port of Tacoma shall secure the area with a perimeter of not less than thirty (30) feet until all procedures are completed and the parties agree that activities can resume. If such a perimeter would materially impact agency functions mandated by law, related to health, safety or environmental concerns, then the secured area shall be of a size and extent practicable to provide maximum protection to the resource under the circumstances. Work in the immediate area will not resume until all procedures are completed and the parties agree that activities can resume.

3. The qualified archaeologist, in coordination with the Department of Archaeology and Historic Preservation (DAHP), will evaluate all inadvertently discovered cultural resources that may be considered eligible for listing in the National Register of Historic Places (NRHP) and recommend whether the cultural resource is eligible for listing in the NRHP. If the discovery is considered eligible, the DAHP and the concerned Indian Tribe(s) will consult to determine appropriate treatment, including but not limited to, photography, mapping, sampling, etc.

4. Port of Tacoma shall ensure that its appropriate personnel, contractors and permittees follow procedures stipulated in this Agreement and treat all human remains, cultural items and potential historic properties with respect.

Human Remains and Associated Funerary Objects

5. If human remains are found, Port of Tacoma shall immediately notify Tribal Police who will contact the tribal archaeologist, the Tacoma Police Department, and/or the County Coroner to determine whether the remains are Native American and to eliminate the



PUYALLUP TRIBE OF INDIANS
DEVELOPMENT & CONSTRUCTION PERMIT APPLICATION



site as a crime scene. Any potential or actual human remains and/or associated funerary objects shall remain in place, unwashed, un-cleaned and without analysis, with minimal disturbance and left in the original location until the remains can be determined to not be of significant cultural value by a professional archaeologist qualified to identify human skeletal remains.

6. If the human skeletal remains are determined to be Native American, PTOI will notify the DAHP and the concerned Indian Tribe(s). PTOI shall continue to maintain the remains and any associated funerary objects in place, unwashed, unexamined and undisturbed until the concerned Indian Tribe(s), the DAHP determine an appropriate treatment. All parties shall give due consideration to and honor, to the extent possible, requests by the Tribe to leave the remains and/or other cultural items undisturbed and in place. Should the Tribe request to conduct ceremonies or other traditional activities with respect to the remains at the site where the remains were found, PTOI will accommodate such requests to the maximum and practical extent possible.

7. If human remains, funerary objects and/or artifacts are inadvertently collected during any archaeological investigation and identified as Native American in the field or in the laboratory, COT will notify and return the remains, objects and/or artifacts to concerned Indian Tribe(s) within twenty-four (24) hours of the identification, to the extent possible. Such human remains, funerary objects and/or artifacts shall remain unwashed and without further analysis.

Confidentiality of Information

8. All involved parties shall make its best efforts to ensure that its appropriate personnel, contractors, and permittees keep the discovery of all inadvertent discoveries confidential, including but not limited to, refraining from contacting the media or any third party or otherwise sharing information regarding the discovery with any member of the public. Prior to any release, COT, concerned Tribe(s), and the DAHP, shall concur on the amount of information, if any, to be released to the public, any third party, and the media and the procedures for such a release, to the extent permitted by law.

CONTACT INFORMATION (Agencies, Companies, Departments)

See Attachment A.

Signature of Applicant: _____

Jenn Stebbings
Environmental Project Manager
Port of Tacoma

**Attachment A - Monitoring & Contact Information
For
Inadvertent Discovery Plan
Port of Tacoma's
Terminal 3 & Terminal 4 Shore Power Project
Tacoma, Washington
February 1, 2022**

The Port of Tacoma (Port) intends to install shore power at Piers 3 and 4. The site is located at 1101 Port of Tacoma Road, Tacoma, Pierce County, Washington and is referred to as Husky Terminal. The Project involves trenching and excavation to install vaults and new conduit.

Contacts

Upon any discovery, immediately contact Port of Tacoma and secure the area.

Port of Tacoma

P.O. Box 1837, Tacoma, WA 98401

Primary Contact: Hughes Wike, Engineering Project Manager, 253-830-5303

Secondary Contacts: Jenn Stebbings, 253-592-6793 or Graham VanderSchelden, 253-592-6791

Puyallup Tribe

Attention: Tribal Chairman, 3009 Portland Ave, Tacoma, Washington 98404

Lead Representative: Bill Sterud, Chairman, 253-573-7800

Primary Contact: Brandon Reynon, Archaeologist/Tribal Historic Preservation Officer, 253-573-7986

Secondary Contact: Jennifer Keating, Planner/Assistant Tribal Historic Preservation Officer, 253-549-5397

Tacoma Police Department

3701 South Pine Street, Tacoma, WA 98409

Lead Representative: Avery Moore, Chief of Police, 253-591-5900

Pierce County Medical Examiner's Office

3619 Pacific Avenue, Tacoma, Washington 98418

Chief Medial Examiner: Karen Cline-Parhamovich, D.O., 253-798-6494

**Port of Tacoma
Terminal 3 & Terminal 4 Shore Power Project**

**Appendix G
Phase 1 Construction Restart
COVID-19 Job Site Requirements**

Phase 1 Construction Restart COVID-19 Job Site Requirements

Phase 1: Low-risk construction work resumes.

Any existing construction projects complying with the points below may resume only those work activities that do not require workers to be closer than six-feet together. If a work activity requires workers to be closer than six-feet, it is not considered low-risk and is not authorized. Adherence to the physical distancing requirement and the health and safety points below will be strictly enforced.

Prior to recommencing work all contractors are required to develop and post at each job site a comprehensive COVID-19 exposure control, mitigation, and recovery plan. The plan must include policies regarding the following control measures: PPE utilization; on-site social distancing; hygiene; sanitation; symptom monitoring; incident reporting; site decontamination procedures; COVID-19 safety training; exposure response procedures; and a post-exposure incident project wide recovery plan. A copy of the plan must be available on each job site during any construction activities and available for inspection by state and local authorities. Failure to meet posting requirements will result in sanctions, including the job being shut down.

All Contractors are required to post at each job site written notice to employees, subcontractors and government officials the Phase 1 work that will be performed at that job site and signed commitment to adhere to the requirements listed in this document.

All contractors have a general obligation to keep a safe and healthy worksite in accordance with state and federal law. Failure to follow these requirements will be considered a violation of these duties and be penalized accordingly. Under RCW 49.17.060, “each employer shall furnish to each of their employees a place of employment free from recognized hazards that are causing or likely to cause serious injury or death to his or her employees and shall comply with the rules, regulations, and orders promulgated under this chapter.” The Washington State Department of Labor & Industries’ Division of Occupational Safety and Health (DOSH) is responsible for workplace safety and health, including inspections and enforcement, consultation, technical assistance, training, education and grants.

All contractors are also required to comply with the following COVID-19 worksite-specific safety practices, as outlined in Gov. Jay Inslee’s “Stay Home, Stay Healthy” Proclamation 20-25, and in accordance with the Washington State Department of Labor & Industries General Coronavirus Prevention Under Stay Home-Stay Healthy Order (DOSH Directive 1.70: <https://www.lni.wa.gov/safety-health/safety-rules/enforcement-policies/DD170.pdf>) and the Washington State Department of Health Workplace and Employer Resources & Recommendations at <https://www.doh.wa.gov/Coronavirus/workplace>:

COVID-19 Site Supervisor

1. A site-specific COVID-19 Supervisor shall be designated by the contractor at every job site to monitor the health of employees and enforce the COVID-19 job site safety plan. A designated COVID-19 Supervisor must be present at all times during construction activities, except on single-family residential job sites with 6 or fewer people on the site.

COVID-19 Safety Training

2. A Safety Stand-Down/toolbox talk/tailgate training must be conducted on all job sites on the first day of returning to work, and weekly thereafter, to explain the protective measures in place for all workers. Social distancing must be maintained at all gatherings.
3. Attendance will be communicated verbally and the trainer will sign in each attendee.
4. COVID-19 safety requirements shall be visibly posted on each jobsite.

Social Distancing

5. Social distancing of at least 6 feet of separation must be maintained by every person on the worksite at all times.
6. Gatherings of any size must be precluded by taking breaks and lunch in shifts. Any time two or more persons must meet, ensure minimum 6 feet of separation.
7. Identify “choke points” and “high-risk areas” on job sites where workers typically congregate and control them so social distancing is always maintained.
8. Minimize interactions when picking up or delivering equipment or materials, ensure minimum 6-foot separation.
9. To the extent practical allow only one trade/subcontractor at a time on a jobsite and maintain 6-foot separation social distancing for each member of that trade. If more than one trade/subcontractor must be on the job to complete the job then at a minimum all trades and subcontractors must maintain social distancing policies in accordance with this guidance.

Personal Protective Equipment (PPE) – Employer Provided

10. Provide personal protective equipment (PPE) such as gloves, goggles, face shields and face masks as appropriate, or required, for the activity being performed.
11. Masks, in accordance with Washington Department of Health guidelines, or as required by Washington Department of Labor & Industries (L&I) safety rules, must be worn at all times by every employee on the worksite.
12. Eye protection must be worn at all times by every employee while on worksite.
13. Gloves must be worn at all times by every employee while on worksite. The type of glove worn should be appropriate to the task. If gloves are not typically required for the task, then any type of glove is acceptable, including latex gloves.
14. If appropriate PPE cannot be provided, the worksite must be shut down.

Sanitation and Cleanliness

15. Soap and running water shall be abundantly provided on all job sites for frequent handwashing. Workers should be encouraged to leave their workstations to wash their hands regularly, before and after going to the bathroom, before and after eating and after coughing, sneezing or blowing their nose.
16. When running water is not available, portable washing stations, with soap, are required, per WAC 296-155-140 2(a) – (f). Alcohol-based hand sanitizers with greater than 60% ethanol or 70% isopropanol can also be used, but are not a replacement for the water requirement.
17. Post, in areas visible to all workers, required hygienic practices, including not to touch face with unwashed hands or with gloves; washing hands often with soap and water for at least 20 seconds; use hand sanitizer with at least 60% alcohol; cleaning and disinfecting frequently touched objects and surfaces such as workstations, keyboards, telephones, handrails, machines, shared tools, elevator control buttons, and doorknobs; covering the mouth and nose when coughing or sneezing as well as other hygienic recommendations by the U.S. Centers for Disease Control (CDC).
18. Make disinfectants available to workers throughout the worksite and ensure cleaning supplies are frequently replenished.
19. Frequently clean and disinfect high-touch surfaces on job sites and in offices, such as shared tools, machines, vehicles and other equipment, handrails, doorknobs, and portable toilets. If these areas cannot be cleaned and disinfected frequently, the jobsite shall be shut down until such measures can be achieved and maintained.
20. When the worksite is an occupied home, workers should sanitize work areas upon arrival, throughout the workday and immediately before they leave, and occupants should keep a personal distance of at least 10 feet.
21. If an employee reports feeling sick and goes home, the area where that person worked should be immediately disinfected.

Employee Health/Symptoms

22. Create policies which encourage workers to stay home or leave the worksite when feeling sick or when they have been in close contact with a confirmed positive case. If they develop symptoms of acute respiratory illness, they must seek medical attention and inform their employer.
23. Have employees inform their supervisors if they have a sick family member at home with COVID-19. If an employee has a family member sick with COVID-19, that employee must follow the isolation/quarantine requirements as established by the State Department of Health.
24. Screen all workers at the beginning of their shift by taking their temperature and asking them if they have a fever, cough, shortness of breath, fatigue, muscle aches, or new loss of taste or smell. Thermometers used shall be 'no touch' or 'no contact' to the greatest extent possible. If a 'no touch' or 'no contact' thermometer is not available, the thermometer must be properly sanitized between each use. Any worker with a temperature of 100.4°F or higher is considered to have a fever and must be sent home.

25. Instruct workers to report to their supervisor if they develop symptoms of COVID-19 (e.g., fever, cough, shortness of breath, fatigue, muscle aches, or new loss of taste or smell). If symptoms develop during a shift, the worker should be immediately sent home. If symptoms develop while the worker is not working, the worker should not return to work until they have been evaluated by a healthcare provider.
26. Failure of employees to comply will result in employees being sent home during the emergency actions.
27. Employees who do not believe it is safe to work shall be allowed to remove themselves from the worksite and employers must follow the expanded family and medical leave requirements included in the Families First Coronavirus Response Act or allow the worker to use unemployment benefits, paid time off, or any other available form of paid leave available to the worker at the workers discretion.
28. Any worker coming to work on a construction site in Washington from any state that is not contiguous to Washington must self-quarantine for 14 days to become eligible to work on a job site in Washington.
29. If an employee is confirmed to have COVID-19 infection, employers should inform fellow employees of their possible exposure to COVID-19 in the workplace but maintain confidentiality as required by the Americans with Disabilities Act (ADA). The employer should instruct fellow employees about how to proceed based on the CDC [Public Health Recommendations for Community-Related Exposure](#).

Job Site Visitors

30. A daily attendance log of all workers and visitors must be kept and retained for at least four weeks. The log must include the name, phone number, and email address of all workers and visitors.

No jobsite may operate until the contractor can meet and maintain all requirements, including providing materials, schedules and equipment required to comply.

These Phase 1 COVID-19 job site safety practices are required as long as the “Stay Home, Stay Healthy” Gubernatorial Proclamation 20-25 is in effect or if adopted as rules by a federal, state or local regulatory agency. **All items minus numbers 28 and 30 are subject to enforcement action under L&I’s Division of Occupational Safety and Health (DOSH).**

Workplace safety and health complaints may be submitted to the L&I Call Center: (1-800-423-7233) or via e-mail to adag235@lni.wa.gov. **General questions about how to comply with construction safety practices** can be submitted to the state’s Business Response Center at <https://app.smartsheet.com/b/form/2562f1caf5814c46a6bf163762263aa5>. **All other violations related to Proclamation 20-25** can be submitted via at: <https://bit.ly/covid-compliance>.