March 17, 2022

TO: HOLDERS LIST

SUBJECT: Terminal 3 & Terminal 4 Shore Power Project
CONTRACT NO. 071664

ADDENDUM NUMBER # 02

This addendum is issued to add, revise, remove, and clarify the following:

SPECIFICATIONS

SECTION 00 01 10 – Table of Contents

- Add new Section 26 09 13 – Electrical Power Monitoring and Control.
- Revise section to reflect new contract number 071664.

SECTION 00 01 15 – List of Drawing Sheets

- Revise section to reflect new contract number (071664) and remove sheets S2.6 and S2.7.

SECTION 00 11 13 – Advertisement for Bids

- Revise section to reflect new bidder question deadline of March 24, 2022.
- Revise section to reflect new contract number 071664.

SECTION 00 41 00 – Bid Form

- Revise section to reflect new contract number 071664.

SECTION 00 43 13 – Bid Security Form

- Revise section to reflect new contract number 071664.

SECTION 00 45 13 – Responsibility Detail Form

- Revise section to reflect new contract number 071664.

SECTION 00 52 00 – Agreement Form

- Revise section to reflect new contract number 071664.

SECTION 00 61 13.13 – Performance Bond

- Revise section to reflect new contract number 071664.

SECTION 00 61 13.16 – Payment Bond

- Revise section to reflect new contract number 071664.

SECTION 00 61 23 – Retainage Bond

- Revise section to reflect new contract number 071664.

SECTION 26 09 13 – Electrical Power Monitoring and Control

- Add new section to address electrical power monitoring and control specifications.

SECTION 26 28 00 – MV Automatic Power Factor Correction Capacitors

- Remove Article 2.05I to clarify that capacitor banks are for power factor correction, not for harmonic filtering.
- Revise section to reflect new contract number 071664.

SECTION 27 05 28 – Communications Pathways

- Revise Articles 2.01/2.02 and add Article 2.03 to clarify conduit and innerduct requirements.
- Revise section to reflect new contract number 071664.

SECTION 33 77 00 – Medium Voltage Shore Power Switches in Walk-In Enclosures

- Revise Articles 1.02/2.05 to clarify walk-in enclosures are metal enclosed switchgear, not metal clad.
- Revise Article 1.02B.1 to clarify switchgear needs to be Type 2B.
- Revise section to reflect new contract number 071664.

DRAWINGS

SHEET E4.1 – Pier 3 Conduit and Conductor Schedule

- Clarify Pier 3 conduit and cable routing.
- Revise to reflect new contract number 071664.

SHEET E5.1 – Pier 3 Shore Power One-Line Diagram – Sheet 1

- Clarify that medium voltage (MV) substation transformers are dry-type.
- Revise to reflect new contract number 071664.

SHEET E5.3 – Pier 4 Shore Power One-Line Diagram – Sheet 1

- Clarify that medium voltage (MV) substation transformers are dry-type.
- Revise to reflect new contract number 071664.

END OF SECTION

Sheet No.	Drawing Title
E1.3	Site Electrical Plan - Pier 4
E2.1	Enlarged Shore Power Vault SSB0
E2.2	Enlarged Shore Power Vault SSB1
E2.3	Enlarged Shore Power Vault SSB2
E2.4	Enlarged Shore Power Vault SSB3
E2.5	Enlarged Shore Power Vault SSB4
E2.6	Enlarged Shore Power Vault SSB5
E2.7	Shore Power Vault Photos
E2.8	Below Pier Conduit Routing Elevations
E3.1	Enlarged Electrical Demolition Plan Substation - Pier 3
E3.2	Enlarged Electrical Construction Plan Substation - Pier 3
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
E4.2	Pier 4 Conduit and Conductor Schedule
E5.1	Pier 3 Shore Power One-Line Diagram - Sheet 1
E5.2	Pier 3 Shore Power One-Line Diagram - Sheet 2
E5.3	Pier 4 Shore Power One-Line Diagram - Sheet 1
E5.4	Pier 4 Shore Power One-Line Diagram - Sheet 2
E6.1	Electrical Details
E6.2	Pier 3 Shore Power Control Wiring
E6.3	Pier 4 Shore Power Control Wiring
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
S2.3	Plan - Shore Power Vault SSB1 on Pier 3
S2.4	Plan - Shore Power Vault SSB2 on Pier 3
S2.5	Plan - Typical Shore Power Vault on Pier 4
~~S2.6~~	~~Plan - Vault Wall at SSB4~~
~~S2.7~~	~~Plan - Vault Wall at SSB5~~
S3.1	Core-Drill Details
S4.1	Electrical Equipment Pad
S5.1	Under Wharf Conduit Support Details - Sheet 1
S5.2	Under Wharf Conduit Support Details - Sheet 2

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~~March 24, 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~~071664. 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.

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~~071664

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~~071664/ 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.	

Item No.	Item	Initials/ Comments
	Certificate of Coverage letter issued/dated within the last six (6) months. 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~~071664 (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~~071664, 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)

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

AGENT OR BROKER (FOR INFORMATION ONLY)

_____
_____
_____

KNOW ALL MEN BY THESE PRESENTS:

That _____ as Principal, hereinafter called Contractor, and _____ as Surety, hereinafter called Surety, are held and firmly bound unto the Port of Tacoma as Obligee, hereinafter called the Port, 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~~071664, 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~~071664

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~~071664 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

PART 1 - GENERAL

1.01 SYSTEM DESCRIPTION

A. Furnish, install and test a complete Metering System (MS) as indicated on the drawings and described in this specification. The system is defined to include, but not be limited to, devices for metering electrical service to main 13.8KV circuit of the substation and walk-in enclosure, communication interface hardware, one remote (within 100 feet of the substation and 30 feet from the walk-in enclosure) indoor metering enclosure inter-communication wiring, software, ancillary equipment, installation and connection to contractor furnished touch screen computer workstation and printer wall mounted, in lockable enclosure inside the walk-in enclosure. This system will communicate with existing Siemens WinPM system in the existing Terminal 3 and Terminal 4 substations.

B. The MS shall utilize Ethernet Gateway as the high-speed backbone network that supports direct connection of a personal lap top computer workstation anywhere on the network. See Paragraph 2.03.

C. Application software and device licenses to the Port of Tacoma shall be provided as described in Paragraph 2.04 of this specification.

D. All cabling (intercommunication wiring) shall be supplied and coordinated by the MS System supplier with walk-in enclosure supplier. This applies to factory and field installed cabling requirements.

E. Provide complete catalog data and detailed wiring diagram of the MS system as related to the walk-in enclosure equipment. Submittal shall be detailed and specific. General catalog data if provided is not desired and will be rejected for resubmittal.

1.03 REFERENCES

A. All Power Meters shall be UL and UL Agency compliant, listed per 7207. They shall also have +/- 1% overall system accuracy (including instrument transformer accuracy) from 2% to 100% of rated load. Accuracy is to meet or exceed ANSI C12.1.

B. The system shall comply with the applicable portions of NEMA standards.

1.04 SUBMITTALS

A. Indicate electrical characteristics and connection requirements. When MS components are installed by the power equipment manufacturer, the power equipment shop drawings shall clearly identify the components, the internal connections, and all contractor required field connections. The MS drawings shall show all MS components including necessary component dimensions; type, size, and weight; location of conduit entry and exit; single line diagram indicating internal and external wiring requirements. Drawings shall identify terminal blocks used for interconnections and wire type to be used.

B. Product Data: Provide highlighted and detailed catalog sheets and technical data sheets to indicate physical data and electrical performance, electrical characteristics, and connection requirements. Do Not submit general product data or catalog material unidentified.

1.05 QUALITY

A. The MS vendor shall be ISO 9000 registered to demonstrate quality compliance.

B. MS components included within the substation and walk-in enclosure equipment lineup shall be factory installed, wired and tested prior to shipment to the job site.

PART 2 – PRODUCT

2.01 METERING CABINET

A. The metering cabinet shall be as a minimum, NEMA 1 indoor, door-in-door construction with padlockable front cover, top and bottom screened vents and mounting racks/hardware sized for metering equipment to be provided.

B. The metering cabinet shall be surface mounted indoors in the walk-in enclosure.

C. The Port of Tacoma will furnish padlock at final completion.

D. The metering cabinet shall have separate terminal blocks for incoming and outgoing communications circuit connections.

E. The metering cabinet shall have space sufficient for installation of an Ethernet Gateway and power supply.

2.02 POWER MONITORS

A. The power monitoring system shall be Siemens Sentron PAC4200, no EXCEPTIONS.

B. Power monitoring shall make use of data generated in the individual circuit breaker control relays as provided under Section 33 77 00 Medium Voltage Shore Power Switches in Walk-In Enclosures. Relays shall be Schweitzer relays or Engineer approved equal. The relays shall be installed by the switchgear manufacturer.

C. Power monitoring shall make use of the same potential transformers and current transformers provided for the circuit breaker control relays.

D. Power monitoring data shall be transmitted from the primary circuit breaker of the substation and main breaker of the walk-in enclosure control relays over a twisted pair data cable to a data processor located approximately 100 feet of the main substation and approximately 30 feet of the switchgear in the walk-in enclosure.

E. Provide a communication processor to collect and scale the power monitoring data from each circuit breaker relay. Processor shall be equal to Schweitzer 2030/32 or Engineer approved equal.

F. Power Monitor Installation

1. The switchgear manufacturer shall provide a single termination point for the twisted pair data cables from the circuit breaker relays.

2. Provide raceway for communication wire from the switchgear to the metering cabinet to provide minimum 90-day on-site data transfer and storage with portable lap top connection and remote reading capability.

3. Mount the communication processor in the metering cabinet.

2.03 ETHERNET GATEWAY

A. Advanced Ethernet Gateway (EGX-400) or Engineer approved equal.

1. The advanced Ethernet Gateway shall feature one 10/100baseT Ethernet port and one 100baseFX Fiber Optic port.
2. The advanced Ethernet Gateway shall feature a minimum of 16 MB of internal non-volatile memory.
3. The Ethernet Gateway shall provide storage for standard and to display real-time power equipment data, and historical time/date stamped interval reading data.
4. The Ethernet Gateway shall be capable of accepting HTML files, PDF files, active X CRG, GIF, JPG graphics, MS Office files (doc, xls, ppt, etc.).
5. The Ethernet Gateway shall be configured remotely using a standard Internet browser.
6. The Ethernet Gateway shall feature two serial communication ports: one RS-485 serial port, and a second port configurable for either RS-232 or RS-485 (support for 2-wire or 4-wire).
7. A single Ethernet Gateway, assigned a single IP address, shall provide high speed Ethernet support for up to 32 devices (data logging of up to 6 parameters per metering device, and a minimum of 38 days of non-volatile data logging @ 15-minute intervals).
8. The Ethernet Gateway shall feature the following protocols: Ethernet -- MODBUS/TCP HTTP, FTP. Serial – MODBUS RTU, or PROFIBUS-DP.
9. The Ethernet Gateway shall operate in ambient temperature of -30 to 80° C, an ambient storage temperature of - 40 to 85° C and shall operate in relative humidity of 5 to 95%.
10. The Ethernet Gateway shall be fitted with a web server to allow users to configure its Ethernet and Serial communication parameters, trouble shoot both Ethernet and serial communication, and add devices.
11. The Ethernet Gateway shall be a stand-alone product that offers various mounting configurations and includes at a minimum the following mounting options: DIN- rail mounting or Wall/Panel Mounting.
12. The Ethernet Gateway shall be UL, CUL, CE, NOM and FCC class A compliant.
13. The Ethernet Gateway shall be compatible with Ethernet TCP/IP networks and allows users to access power metering information from any location on a local area network (LAN) or a wide area network (WAN).
14. The Ethernet Gateway shall utilize Modbus/TCP protocol as its high-speed backbone network protocol.

15. The Ethernet Gateway shall allow connection to metering RS-485 field devices. Metering Software running on a PC with a Modbus/TCP driver shall be able to access monitoring, metering, and protective data via the LAN. The PC shall be connected to the Ethernet LAN via a Network Interface Card.

16. The gateway shall provide a twisted pair UTP cable connection and a fiber optic port to connect to the Ethernet backbone. The Ethernet twisted-pair port shall have: An RJ45 connector, support for 10/100BaseT connection (10 or 100Mbit auto-negotiate), support for both unshielded twisted-pair (UTP) as well as shielded twisted-pair (STP) wiring. Gateway shall also provide support for a 100baseFX fiber optic connection.

    LEDs to indicate Ethernet activity. The following status LEDs shall be provided for Ethernet communications: one for Physical Ethernet Link (LK), one for Transmit (TX), one for Receive (RX).

17. The Ethernet Gateway shall have two serial RS-485 ports that are used to connect serial field devices to the LAN. Each RS-485 serial port shall have the following specification: Supports up to 32 serial devices without a repeater. Supports Modbus, PROFIBUS-DP, or mixed mode daisy chain devices. Supports both 2-wire or 4-wire daisy chain devices. Support for baud rates of 1200 to 38400. Support for parity values of even and none. Screw type connectors with 5-positions. LEDs to indicate serial communication activity. At a minimum, there shall be the following LED's; One for Transmit (Tx), and one for Receive (Rx) per port.

18. The Ethernet Gateway shall have a minimum of one port that can be configured for either RS-485 or RS-232.

19. Each serial port shall have configurable biasing and termination to support 2-wire and 4-wire communicating devices.

20. The Ethernet Gateway shall allow a Modbus master on one of its serial ports to request data from devices on the second serial port.

21. The Ethernet Gateway shall be compliant to industrial temperature. It shall withstand an operating temperature range of -30 deg. C to +80 deg. C.

22. The Ethernet Gateway shall be configurable by either: Local RS-232 connection and a Hyper Terminal® interface or local or remote Ethernet connection and a standard web browser.

23. The Ethernet Gateway shall provide multilingual user interface that includes English.

24. Setup of the Ethernet communication card shall be accomplished via the on-board Ethernet port and a web browser. It shall also be possible via the Ethernet port to upgrade the firmware of the Ethernet communication card in the field to accommodate new system features.

25. All Ethernet cabling shall be installed by a qualified data communications cable installer or the electrical contractor qualified to install data

communications equipment. All communications cabling shall be Category 5 rated for 100baseT, or Fiber Optics rated for 100baseFX.

B. Additional Network Media Options

1. Ethernet shall be used where shown on the project drawings. Ethernet Gateways shall be provided by the OMS vendor and installed by System Installer. Ethernet network connections shall be established using industry standard Ethernet protocols such as TCP/IP. All components shall work with existing Ethernet Gateway, Router, and Hub technology. Use of Ethernet shall be transparent to OMS software and monitoring devices.

2.04 TENANT METERING SOFTWARE

A. The METERING SOFTWARE shall operate using Windows-based operating system.

B. The METERING SOFTWARE shall have a simple user interface for managing individual meter information for each substation (Terminal 3 and 4).

C. The METERING SOFTWARE shall be capable of providing metering information for Electricity monitoring.

D. The METERING SOFTWARE shall allow selection of the time Period (Start date/time and End date/time) for trending purposes.

E. The METERING SOFTWARE shall support “interval data” readings of electricity imported from a database. *For example*: kWHrs (Energy) and kWD (Demand) from each meter in the system -- typically sampled at a 15-minute interval.

F. METERING SOFTWARE Database compatibility

1. Shall support reading “interval data” directly from a Microsoft SQL database.

2. Shall utilize Microsoft SQL to execute the database queries to minimize query times.

3. Microsoft Access shall not be acceptable, due to database processing speed limitations.

G. The METERING SOFTWARE shall support the following User-configurable calculations:

1. Electrical Energy

2. Demand

3. Power Factor

5. Custom Miscellaneous

H. The METERING SOFTWARE shall include a “Coincident Demand” cost allocation function. This function will not be utilized for this project.

1. Determine the Peak Demand, date and time for the main meter at the Substation main breaker and walk-in enclosure main breaker.

2. Query the “interval data” database to identify the Demand reading at each submeter co-incident (at the same date and time) as the main meter.

I. The METERING SOFTWARE shall identify if any expected meter readings (data points) are missing from the system database, and shall provide these Statistics to the User. The METERING SOFTWARE will execute the program even if some data points are missing, and will attempt to estimate missing data points, when feasible.

J. The METERING SOFTWARE shall be authored by the system manufacturer.

1. System manufacturer must have the capability to customize the METERING SOFTWARE core software program for special Owner requirements.

2. System manufacturer shall provide complete documentation to the User for program operations and configuration. Provide written manuals and extensive on-line Help screens.

3. System manufacturer shall maintain a full-time Technical Support group

a. Free Telephone Tech Support Center

b. Free Tech Support Web Site

c. Optional Priority Support (remote troubleshooting via modem)

4. System manufacturer shall maintain a full-time Engineering Services group

a. System integration capabilities

b. Energy usage consulting capabilities

c. Power Quality consulting capabilities

5. System manufacturer shall maintain a full-time Customer Training group

K. The METERING SOFTWARE shall include the following Output options:

1. Report: USAGE BY METER -- a printout showing each meter’s information -- with each meter’s information printed on a separate page.

2. Report: OWNER REPORT -- a printout showing the Total Energy Consumption and Demand calculated for the facility, and each Meter.

3. Spreadsheet: SUMMARY REPORT -- Export the Total Consumption and Demand and each Meter’s Consumption and Demand monthly amount to a Microsoft Excel spreadsheet file for custom reporting or data export by the User.

2.05 EPMS SERVER

A. The EPMS Server computer include 1 factory supplied computer with at least the following features.

1. Server computer with 4GB RAM, dual 2GHz CPU, 146 GB storage on SCSI RAID-1, CD/DVD RW drive, touch screen monitor, and XGA video card.

2. Microsoft Server 2014
3. Windows-based operating system.
4. Microsoft Office recommended for reporting
5. PDF maker recommended for reporting.
6. A minimum of one (1) parallel port and two (2) serial ports.
7. Dual NIC Card – 10/100 Base T
8. Auto-reboot capability upon return from power failure. Necessary programs must then automatically launch without user intervention.
9. One 400VA, 120VAC, plug-in UPS.

2.06 EMPS STANDARD GRAPHIC DISPLAY FEATURES:

A. The EPMS installation shall include as standard a graphical package that allows custom developed graphic screens to match customer on-line drawings, customer floor plan or actual power distribution equipment front elevations, as agreed upon by owner. Owner shall be able to select colors, numbering scheme and general arrangement of screens.

2.07 METERING SYSTEM CABLING

A. Metering system manufacturer shall provide all factory and field wiring. Coordinate length, routing and installation requirements with substation and walk-in enclosure manufacturer.

PART 3 – EXECUTION

3.01 INSTALLATION

A. All control power, CT, PT, RS485 and Ethernet data communications wire shall be installed by substation and walk-in enclosure manufacturer. These requirements are not shown on the drawings. Contractor shall coordinate with the substation and walk-in enclosure manufacturer prior to bid and include materials and labor for this work in the bid.

B. Contractor field metering interconnection wiring requirements shall be clearly identified on the MS network drawings, including highlighted product data sheets and detailed wiring diagrams.

3.02 SYSTEM START-UP AND TRAINING

A. On-site start-up and training of the MS shall be included in the project bid. MS vendor to include one-half day of on-site, hands-on orientation training for owner personnel and Engineer with the fully commissioned MS system.

B. Start-up shall include a complete working demonstration of the MS.

C. Training shall include standard documentation and hands-on exercises for owner’s electrical operations personnel and engineers to become familiar with operation of the MS.

D. The project bid shall include 4 days on-site start-up assistance to include 2 trip(s).

E. The power monitoring manufacturer shall provide a dedicated 24/7 telephone technical help center for customers.

END OF SECTION

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 platted.

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.

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 and 2.03 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 (Flexible Fabric)

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 INNERDUCT (Corrugated non-metallic)

A. Acceptable manufacturers:

1. Carlon
2. Pyramid
3. Or Approved Equal

B. Corrugated innerduct for use in existing 4" ducts.

1. Color: Use standard manufacturer's colors
2. Use product in existing 4" conduit runs.
3. Pull Tape: Provide tape per corrugated innerduct.
4. UL: UL 1666 Standard for Riser Application for Optical Fiber Raceway or Washington State Labor and Industries recognized.
5. National Electrical Code (NEC) Compliance: Comply with NEC as applicable.

2.04 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.

2.05 GROUNDING SYSTEM AND CONDUCTORS

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

2.06 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 TIAEIA-569-A recommendations for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.

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

Addendum 01 - [1]
Addendum 02 - [2]

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:

[2] **[1]** 1. Arc-Resistant Type 2B of the main and capacitor bank circuit breakers per ANSI/IEEE C37.20.7, except the three medium voltage switches.

[2] 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

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.

Addendum 01 - [1]
Addendum 02 - [2]

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] 2. One 1,200 Amp frame, 15KV metal~~/clad~~ enclosed, vacuum main circuit breaker with potential transformers (PT's) and current transformers (CT's) ratings as indicated on the drawings.

[2] 3. One 1,200 Amp frame, 15KV metal~~/clad~~ enclosed, 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.

[2] **[1]** 4. Three (3) 1,200 Amp frame, 15KV metal~~/clad~~ enclosed, shore power switches. Arc resistant rating is not required for 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

KEYED NOTES

1. CONTRACTOR SHALL PROVIDE FABRIC INNERDUCT THROUGH ALL 2" CONDUITS TO INSTALL THE FIBER OPTIC CABLE FOR CONDUIT RUNS 10AB, 11AB, AND 12AB. THE 5/C AND 7/C CABLES CAN RUN IN THE 2" CONDUIT OUTSIDE THE INNERDUCT.

2. CONTRACTOR SHALL PROVIDE 3/4" CORRUGATED INNERDUCT THROUGH ALL 4" CONDUITS TO INSTALL THE FIBER OPTIC CABLE FOR CONDUIT RUNS 11AB AND 12AB. THE 5/C AND 7/C CABLES CAN RUN IN THE 4" CONDUIT OUTSIDE THE INNERDUCT.

LEGEND

BOLD TEXT = NEW WORK
THIN TEXT = EXISTING CONDITIONS
(*) = REFER TO NOTES COLUMN

PIER 3 CONDUIT AND CONDUCTOR SCHEDULE

CONDUIT			CONDUCTORS					
ID	SIZE	N/E	SIZE	GROUND	FROM	TO	VIA VAULTS	NOTES (*)
3TPU1	6"	NEW	BY TPU	BY TPU	TPUPV9	TPU 810 VAULT		ONE RUN OF 3#350 CU 15kV CABLE WITH #4/0 CU NEUTRAL BY TPU
3TPU2	6"	NEW	NONE	NONE	TPUPV9	TPU 810 VAULT		SPARE CONDUIT
3TPU3	6"	NEW	BY TPU	BY TPU	TPU 810 VAULT	774 VAULT		ONE RUN OF 3#350 CU 15kV CABLE WITH #4/0 CU NEUTRAL BY TPU
3TPU4	6"	NEW	NONE	NONE	TPU 810 VAULT	774 VAULT		SPARE CONDUIT
3TPU5	6"	NEW	BY TPU	BY TPU	TPUPV9	TPU 810 VAULT		ONE RUN OF 3#350 CU 15kV CABLE WITH #4/0 CU NEUTRAL BY TPU
3TPU6	6"	NEW	BY TPU	BY TPU	TPUPV9	TPU 810 VAULT		SPARE CONDUIT
3PRI1	4"	NEW (*)	3#350kcmil, 15kV	1#4/0	774 VAULT	PRI BREAKER		PORTION OF CIRCUIT REUSES EXISTING DUCT BANK
3PRI2	4"	NEW (*)	NONE	NONE				PORTION OF CIRCUIT REUSES EXISTING DUCT BANK, SPARE CONDUIT
3SEC1	4"	NEW	3#350kcmil, 15kV	1#4/0	SEC BREAKER	WALK-IN ENCLOSURE		
3SEC2	4"	NEW	3#350kcmil, 15kV	1#4/0	SEC BREAKER	WALK-IN ENCLOSURE		
0A	5"	NEW	3#350kcmil, 15kV	1#1/0	SWITCH-0A	HVSC B0-A	SSPV1, SSPV2, SSPV10	
0B	5"	NEW	3#350kcmil, 15kV	1#1/0	SWITCH-0B	HVSC B0-B	SSPV1, SSPV2, SSPV10	
1A	5"	EXIST (*)	3#350kcmil, 15kV	1#1/0	SWITCH-1A	HVSC B1-A	SSPV1, SSPV2, SSPV3	ADJUST CONDUIT ROUTING TO SWITCH 1 - ADD CONDUIT AS REQ'D
1B	5"	EXIST (*)	3#350kcmil, 15kV	1#1/0	SWITCH-1B	HVSC B1-B	SSPV1, SSPV2, SSPV3	ADJUST CONDUIT ROUTING TO SWITCH 1 - ADD CONDUIT AS REQ'D
2A	5"	EXIST (*)	3#350kcmil, 15kV	1#1/0	SWITCH-2A	HVSC B2-A	SSPV1, SSPV2, SSPV3, SSPV4, SSPV5	ADJUST CONDUIT ROUTING TO SWITCH 2 - ADD CONDUIT AS REQ'D
2B	5"	EXIST (*)	3#350kcmil, 15kV	1#1/0	SWITCH-2B	HVSC B2-B	SSPV1, SSPV2, SSPV3, SSPV4, SSPV5	ADJUST CONDUIT ROUTING TO SWITCH 2 - ADD CONDUIT AS REQ'D
10AB	2"	NEW (*)	7/C #10 AWG, 600V 5/C #10 AWG, 600V 1 FIBER OPTIC (*)	1#10 1#10	WALK-IN ENCL	HVSC B0-AB	SDV1, SDV2, SDV3, WPV1	PORTION OF CIRCUIT REUSES EXISTING 4" C BETWEEN SDV1 AND SDV3 AND 2" C BETWEEN SDV3 AND WPV1 3-PAIR FIBER OPTIC CABLE (1)(2)
11AB	4", 2"	EXIST (*)	7/C #10 AWG, 600V 5/C #10 AWG, 600V 1 FIBER OPTIC (*)	1#10 1#10	WALK-IN ENCL	HVSC B1-AB	SDV1, SDV2, SDV3, SDV4, WPV2	NEW 2" C FROM SDV1 TO WALK-IN ENCL & FROM WPV2 TO HVSC B1-AB 3-PAIR FIBER OPTIC CABLE (1)(2)
12AB	4", 2"	EXIST (*)	7/C #10 AWG, 600V 5/C #10 AWG, 600V 1 FIBER OPTIC (*)	1#10 1#10	WALK-IN ENCL	HVSC B2-AB	SDV1, SDV2, SDV3, SDV4, SDV5, SDV6, SDV7, WPV5	NEW 2" C FROM SDV1 TO WALK-IN ENCL & FROM WPV5 TO HVSC B2-AB 3-PAIR FIBER OPTIC CABLE (1)(2)
3CB	4"	NEW	1#1/0 AWG, 15kV	1#2	CAP BANK	CAP BANK BREAKER		
3C1	2"	NEW	#10 AWG, 600V (*)	1#10	PRI BREAKER	WALK-IN ENCLOSURE		NUMBER OF CONTROLS CONDUCTORS PER VENDOR
3C2	2"	NEW	INSTR CABLE (*)		PRI BREAKER	WALK-IN ENCLOSURE	PROVIDE GRS CONDUIT	NUMBER OF INSTRUMENTATION CABLES PER VENDOR
3C3	2"	NEW	#10 AWG, 600V (*)	1#10	PRI BREAKER	SEC BREAKER		NUMBER OF CONTROLS CONDUCTORS PER VENDOR
3C4	2"	NEW	INSTR CABLE (*)		PRI BREAKER	SEC BREAKER	PROVIDE GRS CONDUIT	NUMBER OF INSTRUMENTATION CABLES PER VENDOR
3C5	2"	NEW	#10 AWG, 600V (*)	1#10	SEC BREAKER	WALK-IN ENCLOSURE		NUMBER OF CONTROLS CONDUCTORS PER VENDOR
3C6	2"	NEW	INSTR CABLE (*)		SEC BREAKER	WALK-IN ENCLOSURE	PROVIDE GRS CONDUIT	NUMBER OF INSTRUMENTATION CABLES PER VENDOR
3C7	4"	NEW	INSTR CABLE (*)		REVENUE METER	WALK-IN ENCLOSURE		CABLES FOR DEMAND METERING

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www.elcon.com

MARK: 1 | REVISION: INNERDUCT NOTES | BY: DKS | APPR: | DATE:

DIMITRIOS K. SIATERLIS — PROFESSIONAL ENGINEER — 2/2/22

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DIRECTOR ENG. DATE | PROJ. ENGR DATE
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TERMINAL 3 / TERMINAL 4
SHORE POWER
PIER 3 CONDUIT AND CONDUCTOR SCHEDULE

SECTION: | RANGE: | TOWNSHIP:
VERT: | DAT-HRZ:
DRAWING SCALE: NONE | PARCEL:

6658
E4.1
52 OF 83

CONT/CONS: 071664
M. ID: 201100.01
PHASE: BID SET

BINDING EDGE

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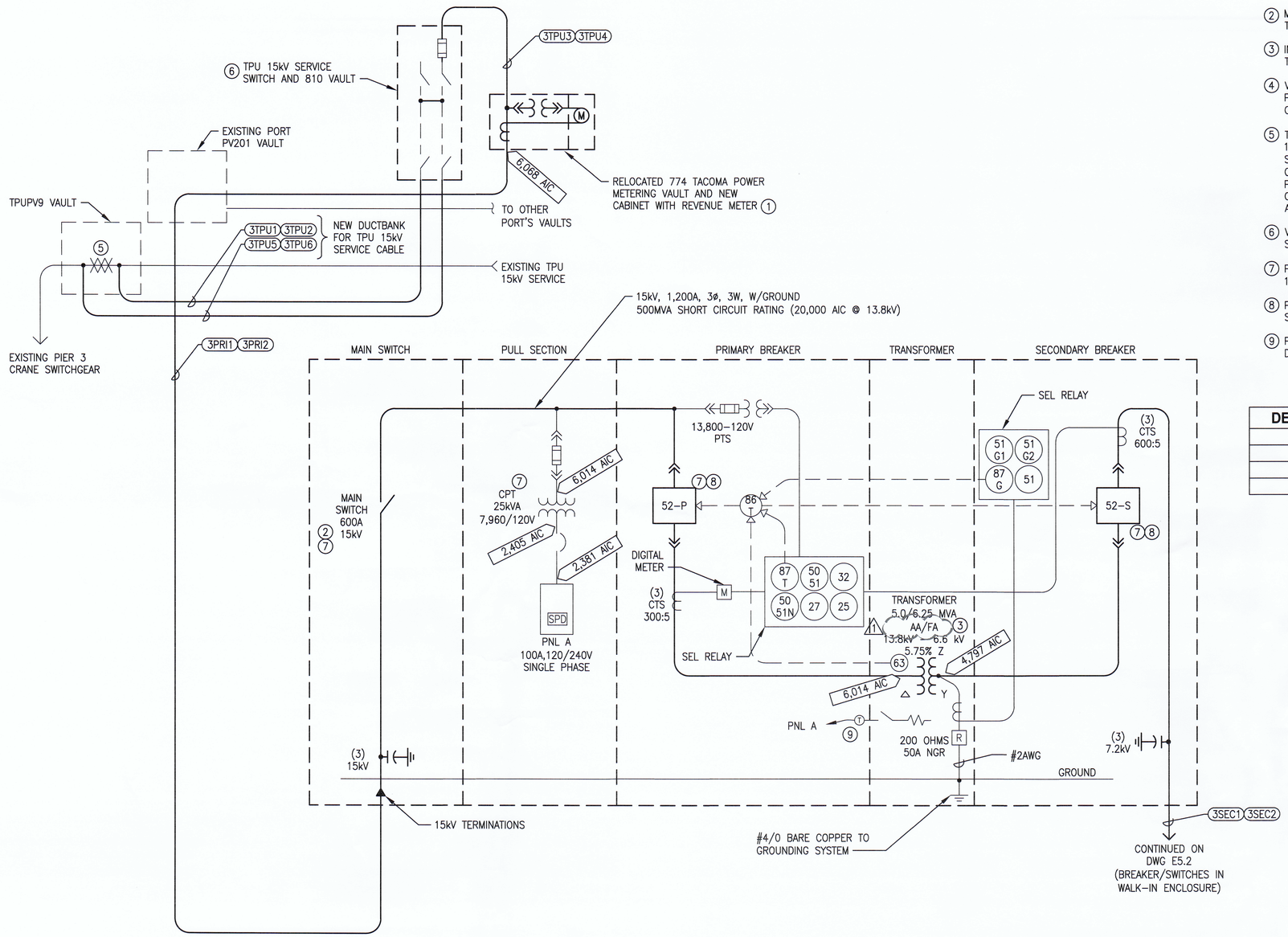

KEY NOTES

1. VAULT RELOCATION BY ELECTRICAL CONTRACTOR, CABINET AND REVENUE METER BY TACOMA POWER.
2. MAIN SERVICE SWITCH SHALL HAVE VISIBLE BLADES TO CONFIRM SWITCH IS IN THE OFF POSITION.
3. INCLUDE PROVISIONS FOR FUTURE FANS ON THE TRANSFORMER, SEE SPECIFICATIONS.
4. VESSEL MAXIMUM DEMAND WAS OBTAINED FROM PORT OF LOS ANGELES ACTUAL DEMAND READINGS OF 74 VESSELS (APRIL 2019).
5. TPU WILL HAVE AN OUTAGE TO INTERCEPT EXISTING 15kV SERVICE AND INSTALL NEW 15kV POWER SWITCH AND REVENUE CABINET/METER. WORK BY CONTRACTOR AND TPU BEFORE OUTAGE SHALL BE PRIORITIZED TO MINIMIZE OUTAGE DURATION. CONTRACTOR SHALL COORDINATE WITH TPU TO ACCOMPLISH THIS WORK.
6. VAULT BY ELECTRICAL CONTRACTOR, 15kV SERVICE SWITCH BY TPU.
7. PROVIDE 15kV IR WINDOWS (MINIMUM 4"ø) AT EACH 15kV CUBICLE OF THE MEDIUM VOLTAGE SUBSTATION.
8. PROVIDE SIEMENS WINPM POWER MONITORING SYSTEM.
9. PROVIDE SPACE HEATER, THERMOSTAT AND DISCONNECT.

DESIGN BASIS LOAD CALCULATIONS 4

VESSEL MAXIMUM DEMAND		
2.59 MW @	0.8 PF	3.24 MVA
CONTINUOUS DEMAND +	125%	4.05 MVA
AMPERAGE @	6.6 kV	354.01 A

PIER 3 SHORE POWER ONE-LINE DIAGRAM - SHEET 1

NO SCALE

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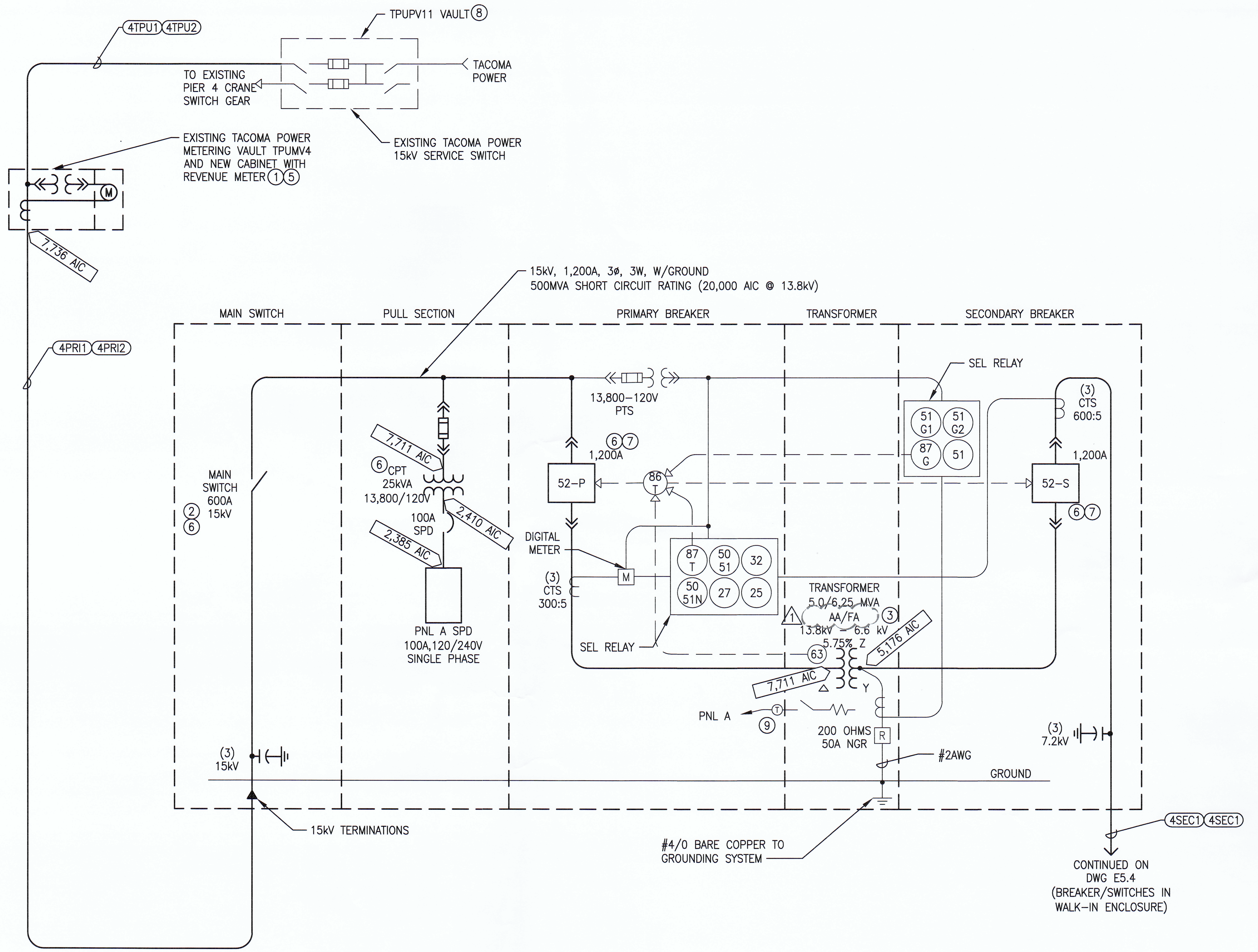
SEATTLE, WASHINGTON 98188
TEL: (206)244-6022
www.elcon.com
MARK: | REVISION: | BY:
1 | TRANSFORMER COOLING | SAB
DIMITRIS K. SKATHARLIS — STATE OF WASHINGTON — PROFESSIONAL ENGINEER — 2/2/22
CHECKED BY | DATE
PROJ. ENGR | DATE
DIRECTOR ENG. DATE
PRINTED BY: curtis Mar 16, 2022
PORT ADDRESS: ONE SITCUM PLAZA
TACOMA, WA 98401-1837
DRAWING SCALE: AS NOTED
APPROVED: XXX
XXX
TERMINAL 3 / TERMINAL 4
SHORE POWER
PIER 3 SHORE POWER
ONE-LINE DIAGRAM - SHEET 1
TOWNSHIP: | RANGE: | SECTION:
DAT–HRZ: | VERT:
PARCEL:
6658
E5.1
1
54 OF 83
CONT/CONS: 071664
M. ID: 20110001
PHASE: BID SET



KEY NOTES

1. CABINET AND REVENUE METER BY TACOMA POWER.
2. MAIN SERVICE SWITCH SHALL HAVE VISIBLE BLADES TO CONFIRM SWITCH IS IN THE OFF POSITION.
3. INCLUDE PROVISIONS FOR FUTURE FANS ON THE TRANSFORMER, SEE SPECIFICATIONS.
4. VESSEL MAXIMUM DEMAND WAS OBTAINED FROM PORT OF LOS ANGELES ACTUAL DEMAND READINGS OF 74 VESSELS (APRIL 2019).
5. COORDINATE WITH TPU AND PROVIDE ALL MATERIALS AND LABOR PER TPU STANDARDS AND REQUIREMENTS.
6. PROVIDE 15kV IR WINDOWS (MINIMUM 4"ø) AT EACH 15kV CUBICLE OF THE MEDIUM VOLTAGE SUBSTATION.
7. PROVIDE SIEMENS WINPM POWER MONITORING SYSTEM.
8. TPU WILL HAVE AN OUTAGE TO PROVIDE CONNECTION TO EXISTING 15kV SERVICE SWITCH.
9. PROVIDE SPACE HEATER, THERMOSTAT AND DISCONNECT.

DESIGN BASIS LOAD CALCULATIONS (4)

VESSEL MAXIMUM DEMAND		
2.59 MW @	0.8 PF	3.24 MVA
CONTINUOUS DEMAND +	125%	4.05 MVA
AMPERAGE @	6.6 kV	354.01 A

PIER 4 SHORE POWER ONE-LINE DIAGRAM - SHEET 1

NO SCALE

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TERMINAL 3 / TERMINAL 4
SHORE POWER
PIER 4 SHORE POWER
ONE-LINE DIAGRAM - SHEET 1

TOWNSHIP: | RANGE: | SECTION:
DAT-HRZ: | VERT:
PARCEL: | DRAWING SCALE: AS NOTED

6658
E5.3
56 OF 83
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