March 24, 2022

TO: HOLDERS LIST

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

ADDENDUM NUMBER # 03

This addendum is issued to revise and clarify the following:

SPECIFICATIONS

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

- Revise Article 1.02B.1 to clarify both switchgear breakers should be vented outside the walk-in enclosures via plenum.
- Revise Article 2.04E and 2.04V to clarify it is acceptable for steel floor plates to be ASTM A36 steel plate with non-skid coating.
- Revise 2.09F to clarify that arc-resistant rating requirement applies only to breakers, not to switches. Consistent with previously posted Addendum 01.
- Revise 2.10B to clarify battery control power source will be 48VDC battery system.

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

Addendum 01 - [1]
Addendum 02 - [2]
Addendum 03 - [3]

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:

[2] **[1]** **[3]**

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. Both main and capacitor circuit breakers to be vented outside the walk-in enclosure via plenum.

[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

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.

[3] E. The steel floor plate shall be minimum ¼" ASTM A36 steel plate with "non-skid" grey coating on floor, 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

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.

[3] 4. The floor of the walk-in enclosure shall have “non-skid” grey coating.

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] 4. Three (3) 1,200 Amp frame, 15KV metal~~/clad~~ enclosed, shore power
[1] 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)

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.

[3] 11. Arc resistant rating is not required for switches.

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.

[3] B. Vacuum Circuit Breakers shall each include a tripping power source (48VDC battery system). ~~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: