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| <u>1 Related Work</u> | <ul style="list-style-type: none">.1 Refer to other specification sections for related work..2 Refer to Section 01 33 00 for Shop Drawings/Submission requirements. |
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| <u>2 Codes and Standards</u> | <ul style="list-style-type: none">.1 Do complete installation to CSA C22.1-2015 except where specified otherwise..2 CSA Electrical Bulletins in force at time of tender submission, while not identified and specified by number in this Division, are to be considered as forming part of related CSA Part II standard and must be complied with. |
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| <u>3 Permits, Fees</u> | <ul style="list-style-type: none">.1 Submit to Electrical Inspection Department and Supply Authority the necessary number of drawings and specifications for examination and approval prior to commencement of work..2 All bidders to carry a lump sum \$5,00.00 (five thousand dollars) allowance for all costs levied by the power utility.<ul style="list-style-type: none">.1 Utility invoices are to be submitted to the Departmental Representative as proof of payment..2 All utility costs in excess of \$5,00.00 will be addressed as an extra change order to the contract..3 Pay all fees levied by the Supply Authority for upgrade and extension of power to the site and/or connection of the project to their system; for existing redundant overhead power cable removals; for pole adjustments and removals, and all other costs levied by utility for completion of project..4 Co-ordinate and meet requirements of power supply authority. Ensure availability of power when required. |
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- 4 As-Built Drawings .1 During progress of the work keep a record of all variations from the working drawings. At completion of the project submit a set of prints showing variations neatly marked in red to the Departmental Representative. Refer to Section 01 33 00 for more specific requirements.
- 5 Work Included .1 Provide all labour and materials and everything that is required for a complete electrical installation, all in accordance with but not necessarily restricted to the specification and the accompanying drawings.
- .2 The work is to include but not necessarily be limited to:
- .1 A new electrical power service, 120/240 Volt, 200 Amp delivered to site via NSPI supplied, 1 phase, overhead pole line including pole, conductors and pole mounted utility transformer.
- .2 Construction of a new electrical service entrance, complete with utility meter, service entrance rated disconnect switch, distribution panelboard, separate EEMAC 4x stainless steel enclosure for panelboard, junction box, lighting controls, treated timbers, plywood backboard, concrete and concrete formwork.
- .3 Installation of luminaires on new treated timber poles. Wiring and control of luminaires.
- .4 Direct buried PVC conduits and wires pulled through the new conduits. Conduit and wire installed in new timber crib wharf. Conduit and wire installed under new concrete pilecap wharf.
- .5 Construction of 3 new power centres complete with receptacles, conduit and junction box. Wiring of receptacles on powercentres.
- .6 Installation of new Combination Starter for derrick. Wiring of new starter.
- .7 Disconnect and remove electrical system on existing wharf to facilitate demolition of wharf.
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- 6 Minimum Standards .1 The standard established by the drawings and specifications shall not be reduced by any of the codes referred to in 2, and in no instance, will a standard be accepted lower than that established by the Canadian Electrical Code.
- .2 As a "standard of quality" "acceptable manufacturers" catalogue designations are included in portions of this specification and on plans. These catalogue designations and descriptions are not necessarily listed in order of preference and all manufacturer's meeting this "standard of quality" may not be listed.
- 7 Supervision .1 The Contractor shall provide supervision and a sufficiently qualified foreman to insure that the job proceeds in a proper and efficient manner. If in the opinion of the Departmental Representative, such personnel are not competent to carry out their work, the Contractor shall replace these men immediately upon written request of the Departmental Representative.
- 8 Materials and Equipment .1 All material shall be new unless designated existing to be reused, of the best available quality and CSA/ULC approved for their respective use.
- .2 Where there is no alternative to supplying equipment which is not CSA certified, obtain and pay for special approval from an authorized and approved testing and certification agency.
- 9 Tests .1 Test all wiring, included in the contract, to ensure there are no shorts or grounded conductors and that insulation values are as required by the Canadian Electrical Code.
- .2 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.
- .3 Submit test results for Departmental Representatives review.
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| <u>9 Tests
(Cont'd)</u> | .4 | Megger line voltage circuits, feeders and equipment up to 350 V with 500 V instrument. |
| | .5 | Replace conductors that fail insulation test. |
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| <u>10 Protective
Devices</u> | .1 | Ensure circuit protective devices such as over-current trips, relays, and fuses are installed to values and settings as indicated, or required by the Canadian Electrical Code, Part I. |
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| <u>11 Nameplates</u> | .1 | Lamacoid nameplates shall be permanently fixed to loadcentre, junction and pull boxes, enclosures and receptacles. |
| | .2 | Nameplates:
.1 Lamacoid 2 mm thick plastic engraving sheet, black face, white core, mechanically attached. |
| | .3 | Identification to be English and French. Provide one nameplate for each language. |
| | .4 | Size 2 nameplates for pull boxes and junction boxes to indicate circuit numbers contained within. |
| | .5 | Affix Size 2 nameplates to enclosures to identify pole # and or load. |
| | .6 | Affix Size 5 nameplates to backboards adjacent to receptacles according to receptacle designation and circuit number as indicated on drawing. |
| | .7 | Affix Size 5 nameplate, red face, white core, to junction boxes over receptacles to read "Receptacles for Ship to Shore Power Use Only. Improper use is extremely hazardous". |
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11 Nameplates
(Cont'd)

Nameplate Sizes:

Size 1	10 x 50 mm	1 line	3 mm high letters
Size 2	12 x 70 mm	1 line	5 mm high letters
Size 3	12 x 70 mm	2 lines	3 mm high letters
Size 4	20 x 90 mm	1 line	8 mm high letters
Size 5	20 x 90 mm	2 lines	5 mm high letters
Size 6	25 x 100 mm	1 line	12 mm high letters
Size 7	25 x 100 mm	2 lines	6 mm high letters

12 Removals and
Relocations

- .1 Unless designated otherwise equipment designated for removal other than equipment belonging to the local utility, will become the property of the Contractor and be promptly removed from the site.
- .2 Coordinate removals and relocations of utility owned equipment with local authority.
- .3 Pay all associated utility fees for removal, relocation, and/or temporary storage.
- .4 Relocate and/or install guy wires as required to meet utility standards.

13 Cutting,
Patching & Painting

- .1 The Contractor shall perform all cutting, patching, and painting necessary for the proper installation of the work and shall repair any damage done, employing only the services of skilled workmen.

14 Wiring
Identification

- .1 Maintain phase sequence and colour coding throughout.
- .2 Colour code to CSA C22.1 1998.

15 Wiring
Terminations

- .1 Lugs, terminals, screws used for termination of wiring to be suitable for copper conductors.

16 Manufacturers
and CSA Labels

- .1 Manufacturers nameplates and CSA labels to be visible and legible after equipment is installed.

17 Completion of
Work

- .1 On completion of the project, the Contractor shall remove all debris, and equipment made redundant by new work, and leave the site neat and tidy. Equipment shall be checked for proper fitting and alignment, adjusted as required, cleaned and repainted where necessary.
- .2 Furnish a Certificate of Acceptance from the local inspection authority on completion of work to the Eastern Passage Harbour Authority.

PART 1 - GENERAL

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| <u>1.1 Related Work</u> | .1 | General Instructions: | Division 1 |
| | .2 | Common Works Results -
Electrical | Section 26 05 01 |

PART 2 - PRODUCTS

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| <u>2.1 Wire & Cable</u> | .1 | Wire and cable shall conform fully to the latest specifications of the Canadian Standards Association (CSA), Electrical & Electronic Manufacturers Association of Canada, (EEMAC) the Insulated Power Cable Engineers Association (IPCEA), and the American Society of Testing Materials (ASTM). | |
| | .2 | Wiring on circuits exceeding 50 V to ground shall be of solid copper of 98% conductivity and of full size AWG gauge, minimum #12. Insulation shall be cross linked polyethylene rated 600 V on conductors smaller than No 8 and 1000 volts larger than No. 10. Wiring shall be colour coded as follows:
Phase A - Black
Phase B - Red
Neutral - White
Ground - Green | |
| | .3 | Copper conductors sized as indicated with 1000 V insulation of Chemically cross-linked thermosetting polyethylene material rated RW 75: to CSA C22.2 No. 75-M1983. | |
| | .4 | Teck Cable; Rated 90°C:
.1 Conductor: Class B stranded soft copper.
.2 Insulation: cross-linked polyethylene or ethylene propylene rubber, as approved by CSA on Types RW75, X-LINK, Minus 40°C per CSA C22.2, No. 131 (and IPCEA).
.3 Identification: Surface color coding for sizes up to and including #2 AWG. For sizes larger than #2 AWG; number coding.
.4 Grounding Conductor: grounding conductor included in the cable assembly.
.5 Multiple conductor cables assembled with suitable fillers and binder tape. | |

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| <u>2.1 Wire & Cable
(Cont'd)</u> | .4 | (Cont'd)
.6 Inner Jacket: Polyvinyl Chloride (PVC)
heat, flame and moisture resistant jacket,
suitable for installation in temperatures
down to Minus 40°C.
.7 Armour: Aluminum interlocking armour.
.8 Outer Jacket: Polyvinyl Chloride (PVC)
heat, flame and moisture resistant jacket,
black, suitable for installation in
temperatures down to Minus 40°C.
.9 Size and number of conductors as
indicated on the drawings. |
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| <u>2.2 Wire
Connections</u> | .1 | Splices and joints in circuit wiring shall
be made using: a) Mechanical split bolt
connectors. Acceptable manufacturers -
Thomas & Betts; Ilsco. |
| | .2 | Stainless steel, liquid tight cable glands
(connectors) c/w threaded lock nuts for
entrance to junction boxes and device boxes.
Sized to suit individual cable diameters. |

PART 3 - EXECUTION

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| <u>3.1 Installation of
Wire & Cable</u> | .1 | Identify wiring with permanent indelible
identifying marks, either numbered or
coloured plastic tapes, on both ends of
phase conductors of feeders and branch
circuit. |
| | .2 | Maintain phase sequence and colour coding
throughout in accordance with Item 4-036 of
the Canadian Electrical Code Part I. |
| | .3 | Install TECK cables as indicated on the
drawings. |
| | .4 | Support TECK cables as indicated on drawings
and according to requirements of the
Canadian Electrical Code. Use corrosion
resistant cable supports. |
| | .5 | New Teck cables to be continuous with no
splices. |
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3.2 Wire & Cable
Connection

- .1 All connections shall be made electrically and mechanically secure. Sizes of connectors shall be according to manufacturer's recommendations for each wire size and combination of wires.
- .2 Install liquid tight cable glands (connectors) at all flexible cable termination points ie... junction boxes and devices boxes.
- .3 Provide galvanized steel cable guards, to protect Teck Cables at all poles, to meet utility standards. Paint with two coats marine grey enamel.

PART 1 - GENERAL

1.1 RELATED
SECTIONS

- .1 Common Work Results Electrical 26 05 01

1.2 REFERENCES

- .1 American National Standards Institute (ANSI)/Institute of Electrical and Electronics Engineers (IEEE)
- .2 Canadian Standards Association, (CSA International)

PART 2 - PRODUCTS

2.1 Equipment

- .1 System and circuit, equipment, grounding conductors, bare stranded copper, un-tinned, soft annealed, size as indicated.
- .2 Insulated grounding conductors: green, type RW90 to Section 26 05 21.
- .3 Rod electrodes: copper clad steel, 19 mm dia by 3000 mm long.
- .4 Non-corroding accessories necessary for grounding system, type, size, material as indicated, including but not necessarily limited to:
 - .1 Grounding and bonding bushings.
 - .2 Protective type clamps.
 - .3 Bolted type conductor connectors.
 - .4 Thermit welded type conductor connectors.
 - .5 Bonding jumpers, straps.
 - .6 Pressure wire connectors.

PART 3 - EXECUTION

3.1 Installation
General

- .1 Install complete permanent, continuous, system and circuit, equipment, grounding systems including, electrodes, conductors, connectors, accessories, as indicated, to conform to requirements of Engineer, and local authority having jurisdiction over installation. Where EMT is used, run separate ground wire in conduit.
- .2 Install rod electrode and make grounding connections.
- .3 Install connectors in accordance with manufacturer's instructions.
- .4 Protect exposed grounding conductors from mechanical injury.
- .5 Use mechanical connectors for grounding connections to equipment provided with lugs.
- .6 Soldered joints not permitted.
- .7 Install an integral bonding wire in all flexible conduit, connected at both ends to grounding bushing, solderless lug, clamp or cup washer and screw.
- .8 Install separate ground conductor to outdoor lighting standards.
- .9 Make connections to ground bar(s) and to ground bus in service board as shown on drawings.

3.2 System and
Circuit Grounding

- .1 Install system and circuit grounding connections to neutrals of the secondary 120/240 V systems.

3.3 Equipment
Grounding

- .1 Install grounding connections to typical equipment included in, but not necessarily limited to following list. Service equipment, transformers, switchgear, distribution panels and outdoor lighting.

3.4 Field Quality
Control

- .1 Perform tests in accordance with Section 26 05 01.
- .2 Perform ground continuity and resistance tests using method appropriate to site conditions and to approval of IPHA and local authority having jurisdiction over installation.
- .3 Perform tests before energizing electrical system.

PART 1 - GENERAL

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| <u>1.1 References</u> | .1 | Canadian Standards Association (CSA)
.1 CAN/CSA C22.2 No. 18-98, Outlet Boxes,
Conduit Boxes, and Fittings and Associated
Hardware.
.2 CSA C22.2 No. 83-M1985(R1999),
Electrical Metallic Tubing. |
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PART 2 - PRODUCTS

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| <u>2.1 Conduits</u> | .1 | Rigid pvc conduit: to CSA C22.2 No. 211.2. |
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| <u>2.2 Conduit
Fastenings and
Supports</u> | .1 | PVC coated one hole steel pipe straps for
surface conduits less than 50 mm and
smaller. Two hole PVC coated steel pipe
straps for conduits larger than 50 mm. |
| | .2 | Galvanized fastening hardware. |
| | .3 | Male and female threaded PVC adapters. |

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| <u>2.3 Conduit
Fittings</u> | .1 | Factory "ells" where 90° bends are required
for 25 mm and larger conduits. |
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| <u>2.4 Expansion
Fittings for Rigid
Conduit</u> | .1 | Weatherproof expansion fittings with
internal bonding assembly suitable for 200
mm linear expansion. |
| | .2 | Watertight expansion fittings with integral
bonding jumper suitable for linear expansion
and 19 mm deflection in all directions. |
| | .3 | Weatherproof expansion fittings for linear
expansion at entry to panel. |

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| <u>2.5 Fish Cord</u> | .1 | Polypropylene. |
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PART 3 - EXECUTION

3.1 Conduit Installation

- .1 All conduits and cables shall be kept parallel or perpendicular to wharf lines. All conduits shall be securely held in place at intervals and with supports as required by the Canadian Electrical Code.
- .2 Conduit openings shall be sealed with plugs or caps to prevent entrance of foreign materials. Where conduits pass through a waterproof membrane an oversize sleeve shall be installed and caulking applied to maintain the waterproof properties of the membrane.
- .3 Conduit shall not pass through structural members without the permission of the Engineer.
- .4 Sufficient number of fittings shall be used to permit easy pulling of wires. Conduits shall be continuous. To ensure the conduit is clean and dry before conductors are pulled in, the conduit shall be swabbed out by using a drag consisting of tight rubber washers.
- .5 Install service masts and weatherheads to local utility standards.
- .6 Touch up all marked surfaces using manufacturer's recommended materials and methods.

3.2 Fastenings and Supporting Devices

- .1 Secure all equipment in a manner, so as to not distort or cause undue stress on any components.

PART 1 - GENERAL

<u>1.1 Related Work</u>	.1	Excavation and 10 backfilling:	Section 31 23
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PART 2 - PRODUCTS

<u>2.1 PVC Ducts and Fittings</u>	.1	Rigid PVC conduits - schedule 40 for direct burial: with expanded flange ends, with minimum wall thickness at any point of 2.8 mm. Nominal length: 3 m plus or minus 12 mm.	
	.2	Rigid PVC reducers, bell end fittings, plugs, caps, adaptors as required to make complete installation.	
	.3	Rigid PVC 90° and 45° bends as required.	
	.4	Rigid PVC 5° angle couplings as required.	
	.5	Expansion joints as required.	

<u>2.2 Solvent Weld Compound</u>	.1	Solvent weld compound for PVC joints.	
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<u>2.3 Cable Pulling Equipment</u>	.1	6 mm stranded nylon pull rope tensile strength 5 kN.	
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<u>2.4 Markers</u>	.1	Over all underground conduit install continuously, at 150 mm below grade, 75 mm wide electrical underground polyethylene marking tape with warning "Caution, Caution, Power Lines Below".	
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PART 3 - EXECUTION

<u>3.1 Installation</u>	.1	Install markers as required.	
	.2	Install underground duct (conduit) bank.	

3.1 Installation
(Cont'd)

- .3 Build duct (conduit) bank on undisturbed soil or well compacted granular fill (sand) not less than 150 mm thick, compacted to 95% of maximum proctor dry density.
 - .4 Open trench completely and ensure that no obstructions will necessitate change in grade of conduits.
 - .5 Prior to laying conduits, construct a "mud slab" not less than 75 mm thick extended the entire width of the trench.
 - .6 Install conduits at elevations and with slope as indicated and minimum slope of 1 to 400.
 - .7 Install base spacers at maximum intervals of 1.5 m levelled to grades indicated for bottom layer of ducts.
 - .8 Lay conduits with the configuration and reinforcing as indicated with preformed interlocking, rigid plastic spacers to maintain spacing between ducts at not less than the dimensions indicated on the Bench Section Details. Stagger joints in adjacent layers at least 150 mm and make joints watertight.
 - .9 Use anchors, ties and trench jacks as required to secure conduits and prevent moving while backfilling and tamping.
 - .10 Cover conduits with compacted granular fill (sand) not less than 150 mm above top tier of conduits. Fill voids and spaces between conduits by hand tamping with a plank. Fill to extend the full width of the trench.
 - .11 Provide 50 mm thick, treated plank(s) on top of the compacted fill, centered over the conduits. Planks to extend 50 mm (minimum) past the conduit array on both sides.
 - .12 Clean conduits before laying. Cap ends of conduits during construction and after installation to prevent entrance of foreign material.
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3.1 Installation
(Cont'd)

- .13 Pull through each conduit a steel mandrel not less than 300 mm long and of a diameter 6 mm less than the internal diameter of the conduit, followed by a stiff bristle brush to remove sand, earth and other foreign matter. Pull stiff bristle brush through each conduit immediately before pulling cables.
- .14 In each conduit install pull rope, continuous throughout each conduit run with 3 m spare rope at each end.
- .15 Install expansion joints in conduit systems in all rises above grade and in all connections to fixed equipment and as required by code.
- .16 Install markers as required.
- .17 After installing and backfilling, restore surface to original condition as directed by Engineer.
- .18 Advise Engineer so that he may inspect conduits prior to backfilling. Allow 10 days advance notice.

PART 3 - EXECUTION

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| <u>3.1 Cable
Installation in
Ducts</u> | <ul style="list-style-type: none">.1 Install cables as indicated in ducts..2 Do not pull spliced cables inside ducts..3 Install multiple cables in duct simultaneously..4 Use CSA approved lubricants of type compatible with cable jacket to reduce pulling tension..5 Before pulling cable into ducts and until cables properly terminated, seal ends of lead covered cables with wiping solder; seal ends of non-leaded cables with moisture seal tape..6 After installation of cables, seal duct ends with dust sealing compound. |
| <u>3.2 Field Quality
Control</u> | <ul style="list-style-type: none">.1 Perform tests in accordance with Section 26 05 01 Common Work Results - Electrical..2 Perform tests using qualified personnel. Provide necessary instruments and equipment..3 Check phase rotation and identify each phase conductor of each feeder..4 Check each feeder for continuity, short circuits and grounds. Ensure resistance to ground of circuits is not less than 50 megohms..5 Pre-acceptance tests.<ul style="list-style-type: none">.1 After installing cable but before splicing and terminating, perform insulation resistance test with 500V megger on each phase conductor of the 120 /240 volt system..2 Check insulation resistance after each splice and/or termination to ensure that cable system is ready for acceptance testing. |

3.2 Field Quality
Control
(Cont'd)

- .6 Provide MJHA with list of test results showing location at which each test was made, circuit tested and result of each test.
- .7 Remove and replace entire length of cable if cable fails to meet any of test criteria.

PART 1 - GENERAL

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| <u>1.1 Related Standards</u> | .1 Complete service entrance to conform to Nova Scotia Power Inc.- Service Entrance Standards. |
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PART 2 - PRODUCTS

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| <u>2.1 Supply Data</u> | .1 Service equipment suitable for incoming supply: 120/240V, 200A, 60Hz, single phase, 3 wire, grounded neutral. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <u>2.2 Equipment</u> | <table border="0"><tr><td style="vertical-align: top;">.1</td><td>Panelboard 'A', 200 amp, 250 V, 1 phase, 3 wire.<table border="0"><tr><td style="padding-left: 20px;">.1</td><td>K frame.</td></tr><tr><td style="padding-left: 20px;">.2</td><td>Non interchangeable trip.</td></tr><tr><td style="padding-left: 20px;">.3</td><td>IC. 10 Ka @ 250 V.</td></tr><tr><td style="padding-left: 20px;">.4</td><td>With neutral and grounding kit.</td></tr><tr><td style="padding-left: 20px;">.5</td><td>EEMAC 3R - surface mounted in an EEMAC 4X stainless steel enclosure.</td></tr><tr><td style="padding-left: 20px;">.6</td><td>Copper bussing.</td></tr><tr><td style="padding-left: 20px;">.7</td><td>250 amp lugs.</td></tr><tr><td style="padding-left: 20px;">.8</td><td>30 circuit.</td></tr><tr><td style="padding-left: 20px;">.9</td><td>Bolt on breakers; the number and rating of breakers is shown on the drawings.</td></tr><tr><td style="padding-left: 20px;">.10</td><td>Ground bar.</td></tr></table></td></tr><tr><td style="vertical-align: top;">.2</td><td>Utility Meter Socket:<table border="0"><tr><td style="padding-left: 20px;">.1</td><td>200 amp, 120/240 V, 4 jaw meter socket to meet utility standards.</td></tr><tr><td style="padding-left: 20px;">.2</td><td>Meter supplied and installed by N.S. Power Inc.</td></tr></table></td></tr><tr><td style="vertical-align: top;">.3</td><td>Service entrance rated, main circuit breaker.<table border="0"><tr><td style="padding-left: 20px;">.1</td><td>200 amp, 250 volt</td></tr><tr><td style="padding-left: 20px;">.2</td><td>2 pole</td></tr><tr><td style="padding-left: 20px;">.3</td><td>EEMAC 4x enclosure</td></tr></table></td></tr></table> | .1 | Panelboard 'A', 200 amp, 250 V, 1 phase, 3 wire. <table border="0"><tr><td style="padding-left: 20px;">.1</td><td>K frame.</td></tr><tr><td style="padding-left: 20px;">.2</td><td>Non interchangeable trip.</td></tr><tr><td style="padding-left: 20px;">.3</td><td>IC. 10 Ka @ 250 V.</td></tr><tr><td style="padding-left: 20px;">.4</td><td>With neutral and grounding kit.</td></tr><tr><td style="padding-left: 20px;">.5</td><td>EEMAC 3R - surface mounted in an EEMAC 4X stainless steel enclosure.</td></tr><tr><td style="padding-left: 20px;">.6</td><td>Copper bussing.</td></tr><tr><td style="padding-left: 20px;">.7</td><td>250 amp lugs.</td></tr><tr><td style="padding-left: 20px;">.8</td><td>30 circuit.</td></tr><tr><td style="padding-left: 20px;">.9</td><td>Bolt on breakers; the number and rating of breakers is shown on the drawings.</td></tr><tr><td style="padding-left: 20px;">.10</td><td>Ground bar.</td></tr></table> | .1 | K frame. | .2 | Non interchangeable trip. | .3 | IC. 10 Ka @ 250 V. | .4 | With neutral and grounding kit. | .5 | EEMAC 3R - surface mounted in an EEMAC 4X stainless steel enclosure. | .6 | Copper bussing. | .7 | 250 amp lugs. | .8 | 30 circuit. | .9 | Bolt on breakers; the number and rating of breakers is shown on the drawings. | .10 | Ground bar. | .2 | Utility Meter Socket: <table border="0"><tr><td style="padding-left: 20px;">.1</td><td>200 amp, 120/240 V, 4 jaw meter socket to meet utility standards.</td></tr><tr><td style="padding-left: 20px;">.2</td><td>Meter supplied and installed by N.S. Power Inc.</td></tr></table> | .1 | 200 amp, 120/240 V, 4 jaw meter socket to meet utility standards. | .2 | Meter supplied and installed by N.S. Power Inc. | .3 | Service entrance rated, main circuit breaker. <table border="0"><tr><td style="padding-left: 20px;">.1</td><td>200 amp, 250 volt</td></tr><tr><td style="padding-left: 20px;">.2</td><td>2 pole</td></tr><tr><td style="padding-left: 20px;">.3</td><td>EEMAC 4x enclosure</td></tr></table> | .1 | 200 amp, 250 volt | .2 | 2 pole | .3 | EEMAC 4x enclosure |
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| .1 | K frame. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| .2 | Non interchangeable trip. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| .3 | IC. 10 Ka @ 250 V. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| .4 | With neutral and grounding kit. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| .5 | EEMAC 3R - surface mounted in an EEMAC 4X stainless steel enclosure. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| .6 | Copper bussing. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| .7 | 250 amp lugs. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| .8 | 30 circuit. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| .9 | Bolt on breakers; the number and rating of breakers is shown on the drawings. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| .10 | Ground bar. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| .2 | Utility Meter Socket: <table border="0"><tr><td style="padding-left: 20px;">.1</td><td>200 amp, 120/240 V, 4 jaw meter socket to meet utility standards.</td></tr><tr><td style="padding-left: 20px;">.2</td><td>Meter supplied and installed by N.S. Power Inc.</td></tr></table> | .1 | 200 amp, 120/240 V, 4 jaw meter socket to meet utility standards. | .2 | Meter supplied and installed by N.S. Power Inc. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| .1 | 200 amp, 120/240 V, 4 jaw meter socket to meet utility standards. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| .2 | Meter supplied and installed by N.S. Power Inc. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| .3 | Service entrance rated, main circuit breaker. <table border="0"><tr><td style="padding-left: 20px;">.1</td><td>200 amp, 250 volt</td></tr><tr><td style="padding-left: 20px;">.2</td><td>2 pole</td></tr><tr><td style="padding-left: 20px;">.3</td><td>EEMAC 4x enclosure</td></tr></table> | .1 | 200 amp, 250 volt | .2 | 2 pole | .3 | EEMAC 4x enclosure | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| .1 | 200 amp, 250 volt | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| .2 | 2 pole | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| .3 | EEMAC 4x enclosure | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

PART 3 - EXECUTION

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|-------------------------|---|
| <u>3.1 Installation</u> | .1 Install service and distribution equipment as indicated. |
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- 3.1 Installation
(Cont'd)
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- .2 Connect to incoming service.
 - .3 Ensure all circuit breakers are properly
torqued.
 - .4 Make grounding connections.
 - .5 Meggar all circuits as required by Section
26 05 01 - Common Works Results -
Electrical.

PART 1 - GENERAL

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|-------------------------|----|---|
| <u>1.1 Related Work</u> | .1 | Common Work Results - Electrical: Section 26 05 01. |
| | .2 | Division 1. |

PART 2 - PRODUCTS

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| <u>2.1 Receptacles</u> | .1 | 20 amp, 125 volt, duplex, ground fault circuit interrupter. Nylon construction. Female receptacle CSA configuration 5-20R. Standard of acceptance: Hubbell Marine Product Series Cat # GF530EMA. Other manufacturers meeting this specification will be accepted.
.1 Device box: surface mounted in a duplex "Watertite" device box. Yellow in colour.
.2 Polycarbonate hinged and gasketted "in use" cover.
.3 Receptacle device box and "in use" cover to be products of the same manufacturer. |
| | .2 | 20 amp, 125 V, simplex, locking, female receptacle. CSA configuration L5 - 20R.
.1 Approved for wet applications (marine environment);
.1 Yellow nylon face.
.2 Hubbell Cat. # HBL23CM10 or equal.
.3 Device Box - "Watertite" device box with hinged and gasketted, weatherproof coverplate.
.4 Device box, receptacle cover and receptacle to be products of the same manufacturer and to be a complete assembly. |
| <u>2.2 Junction/Pull Boxes</u> | .1 | Moulded PVC. Reinforced junction and/or pull boxes.
.1 With screw down gasketted cover.
.2 Stainless steel screws.
.3 Conduit hubs.
.4 External mounting feet.
.5 Corrosion resistant.
.6 Approved for wet marine environments.
.7 Size as indicated or as per CEC. |
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3.1 Execution

- .1 Mount junction/pull boxes on plywood backboards as indicated on drawings.
- .2 Install teck cable from junction/pull boxes to receptacles.
- .3 Mount receptacles on plywood backboard as indicated on drawings.
- .4 Make connections - use mechanical bolted connectors and heat shrink boots inside JB/PB.
- .5 Ensure proper operation.

PART 1 - GENERAL

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| <u>1.1 Product Data</u> | .1 | Submit product data in accordance with Section 01 33 00 - Shop drawings and Other Submittal Procedures.. |
| | .2 | Include time-current characteristic curves for breakers with ampacity as indicated in drawing with interrupting capacity of 22,000 A symmetrical (rms) and over at system voltage. |

PART 2 - PRODUCTS

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|---------------------------------|----|---|
| <u>2.1 Breakers
General</u> | .1 | Bolt-on moulded case circuit breaker: quick-make, quick-break type, for manual and automatic operation with temperature compensation for 40°C ambient. |
| | .2 | Common-trip breakers: with single handle for multi-pole applications. |
| | .3 | Magnetic instantaneous trip elements in circuit breakers to operate only when value of current reaches setting. Trip settings on breakers with adjustable trips to range from 3-8 times current rating. |
| | .4 | Circuit breakers with interchangeable trips as indicated. |

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| <u>2.2 Thermal
Magnetic Breakers</u> | .1 | Moulded case circuit breaker to operate automatically by means of thermal and magnetic tripping devices to provide inverse time current tripping and instantaneous tripping for short circuit protection. |
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PART 3 - EXECUTION

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| <u>3.1 Installation</u> | .1 | Install as indicated on panel schedules. |
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PART 1 - GENERAL

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| <u>1.1 Shop Drawings
and Product Data</u> | .1 | Submit shop drawings and product data in accordance with Section 01 33 00- Shop Drawings and other submittal procedures. |
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PART 2 - PRODUCTS

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| <u>2.1 Deck Lighting</u> | .1 | Marine Rated, LED luminaires.
.1 168 watt input, 120 volt.
.2 1000 ma driver.
.3 4000k colour temperature.
.4 IP66 Rated.
.5 R3 Roadway Type III distribution.
.6 Die-cast aluminum; polyester powder coat finish. Gray in colour.
.7 Enhanced corrosion resistant finish rated at 5000 hour exposure to salt spray.
.8 Galvanized steel mounting brackets and hardware suitable for mounting on timber poles.
.9 Standard of acceptance: Holophane Mongoose Series or equal. |
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|---------------------------|----|---|
| <u>2.2 Flood Lighting</u> | .1 | Marine grade LED flood light.
.1 Light output: 177 watt (400W equivalent), vertical distribution.
.2 Die-cast aluminum with copper alloy housing. Epoxy primer, grey finished coat.
.3 4000k colour temperature with a 70 CRI (minimum).
.4 4 modules.
.5 1000 m a driver.
.6 UL standard 1598A (salt water) marine outside tested.
.7 Optical enclosure to be sealed and gasketted to IP66 rating.
.8 Standard of acceptance: Holophane Predator medium LED series.
.9 Galvanized wood pole bracket for Yoke mounting cat # BKT-4G. |
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| <u>2.3 Timber Poles</u> | .1 | Timber poles to be Jack Pine, to CSA 015. Pressure or vacuum treated with Penta preservatives. |
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2.3 Timber Poles .2 Pole to be Class 3, 10.7M in total length.
(Cont'd)

2.4 Lighting Controls .1 Photo Controls

- .1 Conduit wired photo control.
- .2 Manually adjustable level slide.
- .3 120V, 16.5 amps, 2000 watts.
- .4 Light levels: ON at 1.5 F.C. - OFF at 10 F.C.
- .5 Standard of Acceptance: Paragon Cat. # CW-201 or equal.

.2 Lighting Contactors

- .1 Mounted on plywood backboard.
- .2 20 A, 120 V, 60 Hertz coil; 20 amp., 240 contacts, 2 pole.
- .3 Electrically held.
- .4 EEMAC 4x Watertight, corrosion resistant stainless steel enclosure.
- .5 Standard of Acceptance: Allen-Bradley Cat. # 500L-BCD920 or equal.

PART 3 - EXECUTION

3.1 Installation .1 Poles - install poles as indicated and to utility standards.

.2 Luminaires - Install luminaires as indicated and connect to lighting circuits and controls.

.3 Ensure proper operation.

.4 Luminaires and mounting brackets to be products of one manufacturer.