

---

Section	Title	Pages
Division 00 – Procurement and Contracting Requirements		
00 00 00	List of Contents	1
00 00 01	List of Drawings	1
00 01 12	Specification Approval Sheet	1
Division 01 – General Requirements		
01 10 10	General Instructions	6
01 14 10	Scheduling and Management of Work	5
01 33 00	Shop Drawings and Other Submittal Procedures	5
01 35 24	Special Procedures on Fire and Safety Requirements	4
01 35 29	Health and Safety Requirements	9
01 35 43	Environmental Procedures	3
01 45 00	Quality Control	3
01 50 00	Temporary Facilities	2
01 56 00	Temporary Barriers and Enclosures	1
01 61 00	Common Product Requirements	5
01 74 11	Cleaning	1
01 74 21	Construction/Demolition Waste Management & Disposal	2
Division 26 – Electrical		
26 05 00	Common Work Results for Electrical	8
26 05 03	Electrical Removals and Relocations	1
26 05 20	Wire and Box Connectors (0-1000V)	3
26 05 21	Wires and Cables (0-1000V)	3
26 05 28	Grounding – Secondary	2
26 05 29	Hangers and Supports for Electrical Systems	2
26 05 31	Junction and Pull Boxes	2
26 05 32	Outlet Boxes, Conduit Boxes and Fittings	2
26 05 34	Conduits, Conduit Fastenings and Conduit Fittings	3
26 09 23.02	Lighting Control Devices-Photoelectric	2
26 24 01	Service Equipment	1
26 24 16.01	Panelboards Breaker Type	3
26 24 16.03	Electrical Panel Schedules	3
26 27 26	Wiring Devices	4
26 28 13.01	Fuses – Low Voltage	2
26 28 16.02	Moulded Case Circuit Breakers	2
26 28 23	Disconnect Switches – Fused and Non-Fused	2
26 56 20.01	Site Lighting	5

Drawing No	Title	Date
E1 of 3	Wharf Plan – Electrical	2015/07/31
E2 of 3	Electrical Details	2015/07/31
E3 of 3	Wharf Plan – Existing Electrical	2015/07/31

SPECIFICATION APPROVALS

1. APPROVED  
BY: \_\_\_\_\_

DATE: \_\_\_\_\_

2. TENDER  
BY: \_\_\_\_\_

DATE: \_\_\_\_\_



1.1 DESCRIPTION OF WORK

- .1 The work covered under this project consists of the furnishing of all labour, and equipment, for electrical remediation of the structure located at Lord's Cove Wharf, Charlotte Co. NB., in strict accordance with Specifications and accompanying drawings and subject to all terms and conditions of the contract.
- .2 The work consists of but will is not necessarily limited to the following:
  - .1 Removal and disposal of existing electrical equipment as indicated on the plan and in the specification, or as directed by the Departmental Representative.
  - .2 Installation of new electrical equipment, new light fixtures, re-feeding existing equipment, conduit, wire and associated work as indicated on the plan or as directed by the Departmental Representative.
- .3 All other materials required for the execution of this Contract must be supplied by the Contractor.

1.2 SITE OF WORK

- .1 Work will be carried out at Lord's Cove Wharf, Charlotte Co., New Brunswick in the location as shown on the accompanying drawings.

1.3 FAMILIARIZATION WITH SITE

- .1 Before submitting a bid, it is recommended that bidders inspect and examine the site of work and satisfy themselves as to the form and nature of the work, materials, the means of access to the site, and the temporary facilities required for completion of the work. Means of access to the site, severity, exposure and uncertainty of weather, soil conditions, any accommodations they may require, and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid. No allowance shall be made subsequently in this connection on account of error or negligence to properly observe and determine the conditions that will apply.
- .2 Obtain prior permission from the Departmental Representative before carrying out such site inspection.
- .3 Contractors, bidders or those they invite to site are to review specification Section 01 35 29 - Health and Safety Requirements before visiting site. Take all appropriate safety measures for any visit to site, either before or after acceptance of bid.
- .4 Bidders are required to wear all appropriate personnel protective equipment and take all precautionary measures necessary to ensure their safety during any pre-tender visit.
- .5 Contractor shall make own assessment of the site conditions, and difficulties in carrying out the work as specified

---

1.4 CODES AND STANDARDS

- .1 Perform work in accordance with the 2010 National Building Code of Canada, FCC Standard 373 - Standard for Piers and Wharves (<http://www.hrsdc.gc.ca/en.lp.lo.fp.standards.373.shtml>), and any other of provincial or local application including all amendments up to project tender closing date provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.
- .2 Materials and workmanship must meet or exceed requirements of specified standards, codes and referenced documents.

1.5 WORK SCHEDULE

- .1 Submit within 7 work days of notification of acceptance of bid, a construction schedule showing commencement and completion of all work within the time stated on the Bid and Acceptance Form and the date stated in the bid acceptance letter.
- .2 Provide sufficient details in schedule to clearly illustrate entire implementation Plan, depicting efficient coordination of tasks and resources, to achieve completion of work on time and permit effective monitoring of work progress in relation to established milestones.
- .3 As a minimum, work schedule to be prepared and submitted in the form of Bar (GANTT) Charts, indicating work activities, tasks and other project elements, their anticipated durations and planned dates for achieving key activities and major project milestones provided in sufficient details and supported by narratives to demonstrate a reasonable plan for completion of project within designated time. Generally, Bar Charts derived from commercially available computerized project management system are preferred but not mandatory.
- .4 Contractor must ensure that schedule is adhered to meet the requirements without exception.

1.6 ABBREVIATIONS

- .1 Following abbreviations of standard specifications have been used in this specification and on the drawings: CGSB - Canadian Government Specifications Board CSA - Canadian Standards Association ASTM - American Society for Testing and Materials.
- .2 Where these abbreviations and standards are used in this project, latest edition in effect on date of bid call will be considered applicable.

1.7 MEASUREMENT RESPONSIBILITIES

- .1 Notify Departmental Representative at least 72 hours in advance of operations to permit required licensed electrical inspectors to inspect the work done, for payment purposes.

---

1.8 CONTRACTOR'S USE OF SITE

- .1 Co-operate with users of existing facilities. Maintain access to the wharf structures during fishing season and consult with the local Harbour Authority for the site access limitations.
- .2 Should interference occur, take directions from Departmental Representative.
- .3 Construction operations, including storage of materials for this contract, not to interfere with the fishing activity and/or operations at this harbour.
- .4 Responsible for arranging the storage of materials on or off site, and any materials stored at the site which interfere with any of the day to day activities at or near the site will be moved promptly at the Contractor's expense, upon request by Departmental Representative. Obtain and pay for use of additional storage or work areas needed for operations.
- .5 Exercise care so as not to obstruct or damage public or private property in the area.
- .6 Do not unreasonably encumber site with materials or equipment.
- .7 At completion of work, restore area to its original condition. Damage to ground and property will be repaired by Contractor. Remove all construction materials, residue, excess, etc. and leave site in a condition acceptable to Departmental Representative.
- .8 Comply with all regulations and authorities having jurisdiction over the work, whether on land or on water.

1.9 PROJECT MEETINGS

- .1 Contractor will arrange project meetings and assume responsibility for setting times and recording minutes.
- .2 Project meetings will take place on site of work unless so directed by the Departmental Representative.
- .3 Contractor will assume responsibility for recording minutes of meetings and forwarding copies to all parties present at the meetings.
- .4 Have a responsible member of firm present at all project meetings.

1.10 PROTECTION

- .1 Store all materials and equipment to be incorporated into work to prevent damage by any means.
- .2 Repair or replace all materials or equipment damaged in transit or storage to the satisfaction of Departmental Representative and at no cost to Canada.

1.11 ACCEPTANCE

- .1 Prior to the issuance of the Certificate of Substantial Performance, in company with Departmental Representative; make a check of all work. Correct all discrepancies before final inspection and acceptance.

1.12 EXISTING SERVICES

- .1 Where work involves breaking into or connecting to existing services, carry out work at times directed by governing authorities, with minimum of disturbance to site operations.
- .2 Before commencing work, establish location and extent of service lines in area of work and notify Departmental Representative of findings.
- .3 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.
- .4 Provide temporary services when directed by Departmental Representative to maintain critical facility systems.
- .5 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.
- .6 Protect, relocate or maintain existing active services as required. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction over service. Record locations of maintained, re-routed and abandoned service lines.
- .7 The wharf shall remain in full service to the users during the duration of the construction contract.

1.13 WORK COORDINATION

- .1 Responsible for coordinating the work of the various trades, where the work of such trades interfaces with each other.
- .2 Convene meetings between trades whose work interfaces and ensure that they are fully aware of the areas and the extent of where interfacing is required. Provide each trade with the plans and specifications of the interfacing trade, as required, to assist them in planning and carrying out their respective work.
- .3 Canada will not be responsible for or held accountable for any extra costs incurred as a result of the failure to carry out coordination work. Disputes between the various trades as a result of their not being informed of the areas and extent of interface work shall be the sole responsibility to the General Contractor and shall be resolved at no extra cost to Canada.

1.14 WORK COMMENCEMENT

- .1 Mobilization to project site is to commence immediately after acceptance of bid and submission of Site Specific Safety Plan, unless otherwise agreed by Departmental Representative.
- .2 Project work on site is to commence as soon as possible, with a continuous reasonable work force, unless otherwise agreed by Departmental Representative.
- .3 Weather conditions, short construction season, delivery challenges and the location of the work site may require the use of longer working days and additional work force to complete the project within the specified completion time.
- .4 Make every effort to ensure that sufficient material and equipment is delivered to site at the earliest possible date after acceptance of bid and replenished as required.

1.15 DOCUMENTS

- .1 Maintain at job site, one copy each of the following:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Reviewed Shop Drawings.
  - .5 List of outstanding Shop Drawings.
  - .6 Change Orders.
  - .7 Other modifications to Contract.
  - .8 Field Test Reports.
  - .9 Copy of Approved Work Schedule.
  - .10 Health and Safety Plan and other safety related documents.
  - .11 Electrical Lock-out.
  - .12 Fire Safety Hot Work Permit.
  - .13 Permits, Codes and Acts.
  - .14 Waste Management Plan.
  - .15 Other documents as stipulated elsewhere in the Contract Documents, Drawings and these Specifications.

1.16 PERMITS

- .1 In accordance with the General Conditions, obtain and pay for building permit, certificates, licenses and other permit as required by municipal, provincial and federal authorities.
- .2 Provide appropriate notifications of project to municipal and provincial inspection authorities.



- 
- .3 Obtain compliance certificates as prescribed by legislative and regulatory provisions of municipal, provincial and federal authorities as applicable to the performance of work.
  - .4 Submit to Departmental Representative, copy of application forms and approval documents received from above referenced authorities.
  - .5 Comply with all requirements, recommendations and advice by all regulatory authorities unless otherwise agreed in writing by Departmental Representative. Make requests for such deviations to these requirements sufficiently in advance of related work.
- 1.17 NOTICE TO SHIPPING/MARINERS
- .1 Notify the Marine Communications and Traffic Services' Centre, of Fisheries and Oceans Canada, ten (10) days prior to commencement and upon completion of work, in order to allow for the issuance of Notices to Shipping/Mariners.
  - .2 During construction, any vessels or barges utilized must be marked in accordance with the provisions of the Canada Shipping Act Collision Regulations.
- 1.18 FACILITY SMOKING ENVIRONMENT
- .1 Comply with smoking restrictions.
- 1.19 INTERPRETATION OF DOCUMENTS
- .1 Supplementary to GC1.1 of the General Conditions, the Division 01 sections of the specifications take precedence over technical specifications in other divisions of the specifications.
- 1.20 CUTTING, FITTING AND PATCHING
- .1 Execute cutting, fitting and patching required to make work fit properly.
  - .2 Where new work connects with existing and where existing work is altered, cut, patch and make good to match existing work.
  - .3 Do not cut, bore, or sleeve load-bearing members.
  - .4 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.

END OF SECTION

1.1 PROJECT MANAGEMENT

- .1 Contractor to provide a competent project manager or superintendent who shall be continuously on site when all work is being performed.
- .2 The name and credentials of this person to be provided to the Departmental Representative for acceptance.
- .3 The designated person cannot be changed unless agreed to in writing by the Departmental Representative.

1.2 SUBMITTALS

- .1 Upon acceptance of bid and prior to commencement of work, submit to Departmental Representative the following work management documents:
  - .1 Work Schedule as specified herein.
  - .2 Shop Drawing Submittal Schedule specified in section 01 33 00.

1.3 WORK SCHEDULE

- .1 Upon acceptance of bid submit:
  - .1 Preliminary work schedule within 7 calendar days of contract award.
  - .2 Detailed work schedule within 21 calendar days of contract award.
- .2 Schedule to indicate all calendar dates from commencement to completion of all work within the time stated in the accepted bid.
- .3 Provide sufficient details in preliminary schedule to clearly illustrate entire implementation plan, depicting efficient coordination of tasks and resources, to achieve completion of work on time and permit effective monitoring of work progress in relation to established milestones.
- .4 Preliminary work schedule content to include as a minimum the following:
  - .1 Bar (GANTT) Charts, indicating all work activities, tasks and other project elements, their anticipated durations, planned dates for achieving key activities and major project milestones supported with;
  - .2 Written narrative on key elements of work illustrated in bar chart, providing sufficient details to demonstrate a reasonable implementation plan for completion of project within designated time.
  - .3 Generally Bar Charts derived from commercially available computerized project management system are preferred but not mandatory.

- 
- .5 Detailed Work Schedule:
    - .1 Prepare by use of Critical Path Method (CPM) indicating:
      - .1 Complete and detailed sequence of all construction activities. Show projected start and completion dates for each activity.
      - .2 Number of calendar days required to carry out each activity.
      - .3 Critical path items with resulting critical dates, non-critical activities and resulting float time.
      - .4 Actual workdays from non-working days such as weekend and statutory days etc...
      - .5 Projected and actual percentage of work completed for each major work activity.
    - .2 Prepare CPM schedule by use of well recognized and widely used electronic software. Submit copy of schedule in paper format and one electronic version on diskette for each submission.
    - .3 Accompany CPM with written narrative as required and in sufficient detail to fully describe work and demonstrate a reasonable implementation plan for completion of project within designated time.
  - .6 Work schedule must take into consideration and reflect the work phasing, required sequence of work, special conditions and operational restrictions as specified below and indicated on drawings.
  - .7 Schedule work in cooperation with the Departmental Representative. Incorporate within Detailed Work Schedule, items identified by Departmental Representative during review of preliminary schedule.
  - .8 Completed schedule shall be approved by Departmental Representative. When approved, take necessary measures to complete work within scheduled time. Do not change schedule without Departmental Representative's approval.
  - .9 Ensure that all subtrades and subcontractors are made aware of the work restraints and operational restrictions specified.
  - .10 Schedule Updates:
    - .1 Submit on a monthly basis when requested by Departmental Representative.
    - .2 Provide information and pertinent details explaining reasons for necessary changes to implementation plan.
    - .3 Identify problem areas, anticipated delays, impact on schedule and proposed corrective measures to be taken.
  - .11 Departmental Representative will make interim reviews and evaluate progress of work based on approved schedule. Frequency of such reviews will be as decided by Departmental Representative. Address and take corrective measures on items identified by reviews and as directed by Departmental Representative. Update schedule accordingly.

- .12 In every instance, change or deviation from the Work Schedule, no matter how minimal the risk or impact on safety or inconvenience to tenant or public might appear, will be subject to prior review and approval by the Departmental Representative.

#### 1.4 OPERATIONAL RESISTRICTIONS

- .1 The Contractor must recognize that wharf users will be affected by implementation of this contract. The Contractor must perform the work with utmost regard to the safety and convenience of facility occupants and users. All work activities must be planned and scheduled with this in mind. The Contractor will not be permitted to disturb any portion of the wharf without providing temporary facilities as necessary to ensure safe and direct passage through disturbed or otherwise affected areas.

- .2 Contractor to meet with the Departmental Representative on a weekly basis to identify intended work areas, activities and scheduling for the coming week.

##### .3 Safety Signage:

- .1 Provide onsite, and erect as required during progress of work, proper bilingual signage, mounted on self-supporting stands, warning the public of construction activities in progress and alerting need to exercise caution.
- .2 Signage to be professionally printed and mounted on wooden backing, colored and to express messages as directed by the Departmental Representative.
- .3 Generally maximum size of sign should be in the order of 1.0 square meters. Number of signs required will be dependent on number of areas in facility under renovation at any one time.
- .4 Include costs for the supply and installation of these signs in the bid price.

##### .4 Dust and Dirt Control:

- .1 See section 01 74 11 for cleaning requirements.
- .2 Effectively plan and implement dust control measures and cleaning activities as an integral part of all construction activities. Review all measures with the Departmental Representative before undertaking work, especially for major dust generating activities.
- .3 Do not allow demolition debris and construction waste to accumulate on site and contribute to the propagation of dust.
- .4 As work progresses, maintain construction areas in a tidy condition at all times.

#### 1.5 PROJECT MEETINGS

- .1 Schedule and administer project meetings, held on a minimum bi-weekly basis, for entire duration of work and more often when directed by Departmental Representative as deemed necessary due to progress of work or particular situation.

- 
- .2 Prepare agenda for meetings.
  - .3 Notify participants in writing 4 days in advance of meeting date.
    - .1 Ensure attendance of all subcontractors.
    - .2 Departmental Representative will provide list of other attendees to be notified.
  - .4 Hold meetings at project site or where approved by Departmental Representative.
  - .5 Preside at meetings and record minutes.
    - .1 Indicate significant proceedings and decisions. Identify action items by parties.
    - .2 Distribute to participants by mail or by facsimile within 3 calendar days after each meeting.
    - .3 Make revisions as directed by Departmental Representative.
    - .4 Departmental Representative will advise whether submission of minutes by Email is acceptable. Decision will be based on compatibility of software among participants.
  - .6 Departmental Representative will arrange project meetings and assume responsibility for setting times and recording minutes.
- 1.6 WORK COORDINATION
- .1 The General Contractor is responsible for coordinating the work of the various trades and predetermining where the work of such trades interfaces with each other.
    - .1 Designate one person from own employ having overall responsibility to review contract documents and shop drawings, plan and manage such coordination.
  - .2 The General Contractor shall convene meetings between trades whose work interfaces and ensure that they are fully aware of the areas and the extent of where interfacing is required.
  - .3 Submission of shop drawings and ordering of prefabricated equipment or prebuilt components shall only occur once coordination meeting for such items has taken place between trades and all conditions affecting the work of the interfacing trades has been made known and accounted for.
  - .4 Work Cooperation:
    - .1 Ensure cooperation between trades in order to facilitate the general progress of the work and avoid situations of spatial interference.
    - .2 Ensure that each trade provides all other trades reasonable opportunity for the completion of the work and in such a way as to prevent unnecessary delays, cutting, patching and the need to remove and replace completed work.

- .5 No extra costs to the Contract will be considered by the Departmental Representative as a result of Contractor's failure to effectively coordinate all portions of the Work. Disputes between the various trades as a result of their not being informed of the areas and extent of interface work shall be the sole responsibility of the General Contractor to be resolved at own cost.

END OF SECTION

1.1 ADMINISTRATIVE

- .1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Do not proceed with Work affected by submittal until review is complete.
- .3 Present shop drawings and product data in SI Metric units.
- .4 Where items or information is not produced in SI Metric units converted values are acceptable.
- .5 Review submittals prior to submission to Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .6 Notify the Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent Work are co-ordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by review.
- .10 Keep one reviewed copy of each submission on site.

1.2 SUBMITTAL GENERAL REQUIREMENTS

- .1 Submit to Departmental Representative for review submittals listed, including shop drawings, samples, certificates and other data, as specified in other sections of the Specifications.
- .2 Submit with reasonable promptness and in orderly sequence so as to allow for Departmental Representative's review and not cause delay in Work. Failure to submit in ample time will not be considered sufficient reason for an extension of Contract time and no claim for extension by reason of such default will be allowed.
- .3 Do not proceed with work until relevant submissions have been reviewed by Departmental Representative.
- .4 Present shop drawings, product data, samples and mock-ups in SI Metric units.

- 
- .5 Where items or information is not produced in SI Metric units, provide soft converted values.
  - .6 Review submittals prior to submission to Departmental Representative. Ensure during review that necessary requirements have been determined and verified, required field measurement or data have been taken and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents.
    - .1 Submittals not stamped, signed, dated and identified as to specific project will be returned unexamined by Departmental Representative and considered rejected.
  - .7 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
  - .8 Verify field measurements and affected adjacent Work are coordinated.
  - .9 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
  - .10 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative's review.
  - .11 Submittal format: paper originals, or alternatively clear and fully legible photocopies or originals. Facsimiles are not acceptable, except in special circumstances pre-approved by Departmental Representative. Poorly printed non-legible photocopies or facsimiles will not be accepted and be returned for resubmission.
  - .12 Make changes or revisions to submissions which Departmental Representative may require, consistent with Contract Documents and resubmit as directed by Departmental Representative. When resubmitting, notify Departmental Representative in writing of any revisions other than those requested.
  - .13 Keep one reviewed copy of each submittal document on site for duration of Work.
- 1.3 SHOP DRAWINGS AND PRODUCT DATA
- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, product data, brochures, and other data which are to be provided by Contractor to illustrate details of a portion of work.
  - .2 Number of Shop Drawings: submit sufficient copies of shop drawings which are required by the General Contractor and sub-contractors plus 4 copies which will be retained by the Departmental Representative. Ensure sufficient numbers are submitted to enable one complete set to be included in each of the maintenance manuals specified, if applicable.



- 
- .3 Shop Drawings Content and Format:
    - .1 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of work. Where items or equipment attach or connect to other items or equipment, confirm that all interrelated work have been coordinated, regardless of section of trade from which adjacent work is being supplied and installed.
    - .2 Shop Drawings Format:
      - .1 Opaque white prints or photocopies of original drawings or standard drawings modified to clearly illustrate work specific to project requirements. Maximum sheet size to be 1000 x 707 mm.
      - .2 Product Data from manufacturer's standard catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products, to be original full colour brochures, clearly marked indicating applicable data and deleting information not applicable to project.
      - .3 Non or poorly legible drawings, photocopies or facsimiles will not be accepted and returned not reviewed.
  - .4 Supplement manufacturer's standard drawings and literature with additional information to provide details applicable to project.
  - .5 Delete information not applicable to project on all submittals.
  - .6 Allow 10 calendar days for Departmental Representative's review of each submission.
  - .7 Adjustments or corrections made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, advise Departmental Representative in writing prior to proceeding with Work.
  - .8 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections and comments are made, fabrication and installation may proceed upon receipt of shop drawings. If shop drawings are rejected and noted to be Resubmitted, do not proceed with that portion of work until resubmission and review of corrected shop drawings, through same submission procedures indicated above.
  - .9 Accompany each submissions with transmittal letter, in duplicate, containing:
    - .1 Date.
    - .2 Project title and project number.
    - .3 Contractor's name and address.
    - .4 Identification and quantity of each shop drawing, product data and sample.
    - .5 Other pertinent data.
  - .10 Submissions shall include:
    - .1 Date and revision dates.
    - .2 Project title and project number.

- 
- .3 Name and address of:
    - .1 Subcontractor.
    - .2 Supplier.
    - .3 Manufacturer.
    - .4 Contractor's stamp, signed by Contractor's authorized Representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
    - .5 Cross references to particular details of contract drawings and specifications section number for which shop drawing submission addresses.
    - .6 Details of appropriate portions of Work as applicable:
      - .1 Fabrication.
      - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
      - .3 Setting or erection details.
      - .4 Capacities.
      - .5 Performance characteristics.
      - .6 Standards.
      - .7 Operating weight.
      - .8 Wiring diagrams.
      - .9 Single line and schematic diagrams.
      - .10 Relationship to adjacent work.
  - .11 After Departmental Representative's review, distribute copies.
  - .12 Submit 6 copies of product data sheets or brochures for requirements requested in specification Sections as requests, where shop drawings will not be prepared due to standardized manufacture of product.
  - .13 Submit 6 copies of manufacturer's instructions of requirements requested in specifications Sections as requested.
  - .14 Submit 6 copies of Operation and Maintenance Data for requirements requested in specification Sections.
  - .15 Delete information not applicable to project.
  - .16 Supplement standard information to provide details applicable to project.

- .17 The review of shop drawings by the Departmental Representative or by an authorized Consultant or designate is for sole purpose of ascertaining conformance with general concept. This review shall not mean that Canada approves the detail design inherent in the shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting all requirements of the construction and Contract Documents. Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of all sub-trades.

1.4 SCHEDULES, PERMITS AND CERTIFICATES

- .1 Upon acceptance of bid, submit to Departmental Representative copy of Work Schedule and various other schedules, permits certification documents and project management plans as specified in other sections of the Specifications.
- .2 Submit copy of permits, notices, compliance Certificates received by Regulatory Agencies having jurisdiction and as applicable to the work.
- .3 Submission of above documents to be in accordance with Submittal General Requirements procedures specified in this section.
- .4 Immediately after award of Contract, submit Workers' Compensation Board Status.
- .5 Submit transcription of insurance immediately after award of Contract.

END OF SECTION

- 
- Part 1            General
- 1.1            SECTION INCLUDES
- .1          Fire and Safety Requirements.
- .2          Hot Work Permit.
- 1.2            RELATED WORK
- .1          Section 01 35 29 – Health and Safety Requirements.
- 1.3            REFERENCES
- .1          Fire Protection Standards issued by Fire Protection Services of Human Resources Development Canada, as follows:
- .1          FCC No. 301-June 1982 Standard Construction Operations.  
                    (<http://www.hrsdc.ga.ca/en/lp/lo/fp/Standards/301.shtml>).
- .2          FCC No. 302-June 1982 Standard for Welding and Cutting.  
                    (<http://www.hrsdc.ga.ca/en/lp/l/fp/Standards/302.shtml>).
- .3          FCC Standards, may also be viewed at the Regional Fire Protection Service's Office (Previously known as the Fire Commissioner of Canada), located at 99 Wyse Road, 8<sup>th</sup> Floor, Dartmouth, NS, Tel: (902)426-6053.
- 1.4            DEFINITIONS
- .1          Hot Work Defined as:
- .1          Welding Work.
- .2          Cutting of materials by use of torch or other open flame devices.
- .3          Grinding with equipment which produces sparks.
- 1.5            SUBMITTALS
- .1          Submit copy of Hot Work Procedures and sample of Hot Work Permit to Departmental Representative for review, within 14 calendar days after notification of acceptance of bid.
- .2          Submit in accordance with Submittal General Requirements specified in Section 01 33 00.
- 1.6            FIRE SAFETY REQUIREMENTS
- .1          Implement and follow fire safety measures during work. Comply with following:
- .1          National Fire Code, 2010.
- .2          Fire Protection Standards FCC 301 and FCC 302.
- .3          Federal and Provincial Occupational Health and Safety Acts and Regulations as specified in Section 01 35 29.

- .2 In event of conflict between any provisions of authorities, the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, Departmental Representative will advise on the course of action to be followed.

## 1.7 HOT WORK AUTHORIZATION

- .1 Obtain Departmental Representative's written "Authorization to Proceed" before conducting any form of Hot Work on site.
- .2 To obtain authorization submit to Departmental Representative:
  - .1 Contractor's typewritten Hot Work procedures to be followed on site as specified below.
  - .2 Description of the type and frequency of Hot Work required.
  - .3 Sample Hot Work Permit to be used.
- .3 Upon review and confirmation that effective fire safety measures will be implemented during performance of hot work, Departmental Representative will provide authorization to proceed as follows:
  - .1 Issue one written "Authorization to Proceed" covering the entire project for duration of work or;
- .4 Separate work, or segregate certain parts of work, into individual entities. Each entity requiring a separately written "Authorization to Proceed" from Departmental Representative. Follow Departmental Representative's directives in this regard.
- .5 Requirement for individual authorization based on:
  - .1 Nature of phasing or work;
  - .2 Risk to Facility operations;
  - .3 Quantity of various trades needing to perform Hot Work on project or;
  - .4 Other situation deemed necessary by Departmental Representative to ensure fire safety premises.
- .6 Do not perform any Hot Work until receipt of Departmental Representative's written "Authorization to Proceed" for that portion of work.

## 1.8 HOT WORK PROCEDURES

- .1 Develop and implement safety procedures and work practices to be followed during the performance of Hot Work.
- .2 Procedures to include:
  - .1 Requirement to perform hazard assessment of site and immediate Hot Work area for each Hot Work event in accordance with Hazard Assessment and Safety Plan Requirements of Section 01 35 29.
  - .2 Use of Hot Work permit system for each Hot Work event.
  - .3 The step by step process of how to prepare and issue permit.

- .4 Permit shall be issued by Contractor's site superintendant, or other authorized person designated by Contractor, granting permission to worker or subcontractor to proceed with work.
  - .5 Provision of a designated person to carry out a Fire Safety Watch for a minimum of 30 minutes immediately upon completion of the Hot Work.
  - .6 Compliance with fire safety codes and standards specified herein and occupational Health and Safety Regulations specified in Section 01 35 29.
- .3 Generic procedures, is used, must be edited and supplemented with pertinent information tailored to reflect specific project conditions. Clearly label as being the Hot Work Procedures applicable to this contract.
  - .4 Hot Work Procedures shall clearly establish worker instructions and allocate responsibilities of:
    - .1 Worker (s)
    - .2 Authorized person issuing the Hot Work Permit,
    - .3 Fire Safety Watcher,
    - .4 Subcontractors and Contractors.
  - .5 Brief all workers and subcontractors on Hot Work Procedures and Permit system established for project. Stringently enforce compliance.
    - .1 Failure to comply with the established procedures may result in the issuance of a non-compliance Notification at the Departmental Representative's discretion with possible disciplinary measures imposed as specified in Section 01 35 29.

## 1.9 HOT WORK PERMIT

- .1 Hot Work Permit to include, as a minimum, the following data:
  - .1 Project Name and Number
  - .2 Building Name, address and specific room or area where hot work will be performed.
  - .3 Date when permit is issued.
  - .4 Description of hot work type to be performed.
  - .5 Special precautions required, including type of Fire Extinguisher needed.
  - .6 Name and signature of person authorized to issue the permit.
  - .7 Name of worker (clearly printed) to which the permit is being issued.
  - .8 Time duration that permit is valid (not to exceed 8 hours). Indicate start time and date, and completion time and date.
  - .9 Worker signature with date and time upon Hot Work termination.
  - .10 Specified time period requiring safety watch.
  - .11 Name and signature of designated Fire Safety Watcher, complete with time and date when safety watch terminated, certifying that surrounding area was under his/her continual surveillance and inspection during the full watch time period specified in Permit and commenced immediately upon completion of Hot Work.

- .2 Permit to be typewritten form. Industry Standard Forms shall only be used if all data specified above is included on form.
- .3 Each Hot Work Permit to be completed in full and signed as follows:
  - .1 Authorized person issuing permit before Hot Work commences.
  - .2 Worker upon completion of Hot Work.
  - .3 Fire Safety Watcher upon termination of Safety watch.
  - .4 Returned to Contractor's site Superintendant for safe keeping.

1.10 DOCUMENTS ON SITE

- .1 Keep Hot Work Permits and Hazard Assessment documentation on site for duration of work.
- .2 Upon request, make available to Departmental Representative or to authorized safety representative for inspection.

END OF SECTION

1.1 REFERENCES

- .1 New Brunswick Occupational Health and Safety Act (1983).
- .2 Canadian Hazardous Products Act.

1.2 RELATED WORK

- .1 Section 01 35 24 – Special Procedures on Fire Safety Requirements.

1.3 DEFINITIONS

- .1 COSH: Canada Occupational Health and Safety Regulations made under Part II of the Canada Labour Code.
- .2 Competent Person: means a person who is:
  - .1 Qualified by virtue of personal knowledge, training and experience to perform assigned work in a manner that will ensure the health and safety of persons in the workplace, and;
  - .2 Knowledgeable about the provisions of occupational health and safety statutes and regulations that apply to the Work and;
- .3 Medical Aid Injury: any minor injury for which medical treatment was provided and the cost of which is covered by Workers' Compensation Board of the province in which the injury was incurred.
- .4 PPE: personal protective equipment
- .5 Work Site: where used in this section shall mean areas, located at the premises where Work is undertaken, used by Contractor to perform all of the activities associated with the performance of the Work.

1.4 CONTRACTOR QUALIFICATIONS

- .1 Certificate of Recognition (COR) Program: The Contractor shall maintain a valid Letter of Good Standing in the New Brunswick Construction Safety Association (NBCSA) COR Program, or alternatively;
  - .1 Provide evidence of COR status from other member associations of the Canadian Federation of Construction Safety Associations using the NBCSA Reciprocal Process, or;
  - .2 Subject to the conditions specified at Paragraph 1.2.3 in this Section, provide evidence of an audited safety program certified by an independent agency.
- .2 Independent Agency: Acceptance of an audited safety program certified by an independent agency will be evaluated by the Consultant using NBCSA Safety Audit Instrument. Acceptance of an audited safety program is at the discretion of the Consultant.
- .3 The Contractor shall maintain a valid COR until Final Completion.



1.5 SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00.
- .2 Submit site-specific Health and Safety Plan prior to commencement of Work.
  - .1 Submit within 10 work days of notification of Bid Acceptance. Provide 3 copies.
  - .2 Departmental Representative will review Health and Safety Plan and provide comments.
  - .3 Revise the Plan as appropriate and resubmit within 10 work days after receipt of comments.
  - .4 Departmental Representative's review and comments made of the Plan shall not be construed as an endorsement, approval or implied warranty of any kind by Canada and does not reduce Contractor's overall responsibility for Occupational Health and Safety of the Work.
  - .5 Submit revisions and updates made to the Plan during the course of Work.
- .3 Submit name of designated Health & Safety Site Representative and support documentation specified in the Safety Plan.
- .4 Submit building permit, compliance certificates and other permits obtained.
- .5 Submit copy of Letter in Good Standing from Provincial Workers Compensation or other department of labour organization.
  - .1 Submit update of Letter of Good Standing whenever expiration date occurs during the period of Work.
- .6 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .7 Submit copies of incident reports.
- .8 Submit WHMIS MSDS - Material Safety Data Sheets.
  - .1 Comply with Occupational Health and Safety Act for Province of New Brunswick, and Regulations made pursuant to the Act.
  - .2 OHS is enforced by WorkSafe NB.
  - .3 Comply with Canada Labour Code - Part II (entitled Occupational Health and Safety) and the Canada Occupational Health and Safety Regulations (COSH) as well as any other regulations made pursuant to the Act.
    - .1 The Canada Labour Code can be viewed at:  
[www.http://laws.justice.gc.ca/en/L-2/](http://laws.justice.gc.ca/en/L-2/)
    - .2 COSH can be viewed at: [www.http://laws.justice.gc.ca/eng/SOR-86-304/n e .html](http://laws.justice.gc.ca/eng/SOR-86-304/n e .html)
    - .3 A copy may be obtained at: Canadian Government Publishing Public Works & Government Services Canada Ottawa, Ontario, K1A 0S9 Tel: (819) 956-4800 (1-800-635-7943) Publication No. L31-85/2000 E or F
  - .4 Provide copies of accident and incident reports.

- .5 Observe construction safety measures of:
  - .1 Part 8 of National Building Code
  - .2 Municipal by-laws and ordinances.
- .6 Submit valid copy of Contractor's WorkSafe NB Coverage prior to commencement of Work.
- .7 Provide copies of reports or directions issued by Federal, provincial and Municipal health and safety inspectors.
- .8 Provide Material Safety Data Sheets (MSDS) for controlled products specified by the regulations made under the Hazardous Materials Act.
- .9 In case of conflict or discrepancy between above specified requirements, the more stringent shall apply.
- .10 Maintain Workers Compensation Coverage in good standing for duration of Contract. Provide proof of clearance through submission of Letter in Good Standing.
- .11 Medical Surveillance: Where prescribed by legislation or regulation, obtain and maintain worker medical surveillance documentation.

#### 1.6 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons and environment adjacent to the site to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by all workers, sub-contractors and other persons granted access to Work Site with safety requirements of Contract Documents, applicable federal, provincial, and local by-laws, regulations, and ordinances, and with site-specific Health and Safety Plan.

#### 1.7 SITE CONTROL AND ACCESS

- .1 Control the Work and entry points to Work Site. Approve and grant access only to workers and authorized persons. Immediately stop and remove non-authorized persons.
- .2 Isolate Work Site from other areas of the premises by use of appropriate means.
  - .1 Erect fences, hoarding, barricades and temporary lighting as required to effectively delineate the Work Site, stop non-authorized entry, and to protect pedestrians and vehicular traffic around and adjacent to the Work and create a safe environment.
  - .2 Post signage at entry points and other strategic locations indicating restricted access and conditions for access.
- .3 Provide safety orientation session to persons granted access to Work Site. Advise of hazards and safety rules to be observed while on site.
- .4 Ensure persons granted site access wear appropriate PPE. Supply PPE to inspection authorities who require access to conduct tests or perform inspections.

---

1.8 PROTECTION

- .1 Provide temporary facilities for protection and safe passage of public pedestrians and vehicular traffic around and adjacent to work site.
- .2 Provide safety barricades, lights and signage of work site as required, providing a safe working environment for workers.
- .3 Carry out work placing emphasis on Health & Safety of the Public, Facility Personnel, Construction Works and Protection of the Environment.
- .4 Should unforeseen or peculiar safety related hazard or condition become evident during performance of work, immediately take measures to rectify the situation and prevent damage or harm. Advise Departmental Representative verbally and in writing.

1.9 FILING OF NOTICE

- .1 File Notice of Project with pertinent provincial health and safety authorities prior to beginning of Work.
  - .1 Departmental Representative will assist in locating address if needed.

1.10 PERMITS

- .1 Post permits, licenses and compliance certificates, specified in Section 01 10 10, at Work Site.
- .2 Where a particular permit or compliance certificate cannot be obtained, notify Departmental Representative in writing and obtain approval to proceed before carrying out applicable portion of work.
- .3 Obtain permits, licenses and compliance certificates, at appropriate times and frequency as stipulated by authorities having jurisdiction.

1.11 HAZARD ASSESSMENTS

- .1 Perform site specific health and safety hazard assessment of the Work and its site.
- .2 Carryout initial assessment prior to commencement of Work with further assessments as needed during progress of work, including when new trades and subcontractors arrive on site.
- .3 Record results and address in Health and Safety Plan.
- .4 Keep documentation on site for entire duration of the Work.
- .5 Implement and carry out a health and safety hazard assessment program as part of the work. Program to include:
  - .1 Initial hazard assessments carried out immediately upon notification of contract award and prior to commencement of work.

- .2 On-going hazard assessments performed during the progress of work identifying new or potential health risks and safety hazards not previously known. As a minimum hazard assessments shall be carried out when:
  - .1 New subtrade work, new subcontractor(s) or new workers arrive at the site to commence another portion of the work.
  - .2 The scope of work has been changed by Change Order.
  - .3 Potential hazards or weakness in current health and safety practices are identified by Departmental Representative or by an authorized safety representative.
- .6 Each hazard assessment to be made in writing. Keep copies of all assessments on site for duration of work. Upon request, make available to Departmental Representative for inspection.

#### 1.12 PROJECT/SITE CONDITIONS

- .1 Following are potential health, environmental and safety hazards at the site for which Work may involve contact with:
  - .1 Harbour in use; pedestrians, vehicles or trucks.
  - .2 Working near water courses, and tides.
  - .3 Fire Hazards
  - .4 Overhead utilities
  - .5 Lock Out Procedures required
  - .6 PPE Requirements
  - .7 Heights
  - .8 Possibility of working on barges, unsteady work platform.
- .2 Facility on-going operations:
  - .1 The Contractor will co-operate with users of existing facilities. Maintain access to the existing wharf structures during fishing season and consult with the Departmental Representative for site access limitations.
  - .2 Should interferences occur, take directions from Departmental Representative.
  - .3 Do not unreasonably encumber site with materials.
  - .4 Move stored products or equipment which interfere with operations.
  - .5 Comply with all regulations and authorities having jurisdiction over the work, whether on land or on water.
  - .6 Contractor will note that fishing activity in the harbour includes fishing boats, moorings, etc.

#### 1.13 MEETINGS

- .1 Prior to commencement of work, attend Health and Safety meeting conducted by Departmental Representative. Have Contractor's Site Superintendent in attendance. Departmental Representative will advise of time and location.

- .2 Provide site safety orientation sessions to all workers and other authorized persons prior to granting them access to work site. Brief persons on site conditions and on the minimum site safety rules in force at site.
- .3 Conduct site specific occupational health and safety meetings during the entire work as follows:
  - .1 Formal meetings on a minimum monthly basis.
  - .2 Informal tool box meetings on a regular basis from a predetermined schedule.
  - .3 Keep workers informed of anticipated hazards, on safety practices and procedures to be followed and of other pertinent safety information related to:
    - .1 Progress of Work;
    - .2 New sub-trades arriving on site and;
    - .3 Changes in site and project conditions.
- .4 Record and post minutes of meetings. Make copies available to Departmental Representative upon request.

#### 1.14 HEALTH AND SAFETY PLAN

- .1 Prior to commencement of Work, develop written Health and Safety Plan specific to the Work. Implement, maintain, and enforce Plan for entire duration of Work and until final demobilization.
- .2 Health and Safety Plan shall include the following components:
  - .1 List of health risks and safety hazards identified by hazard assessment.
  - .2 Control measures used to mitigate risks and hazards identified.
  - .3 On-site Contingency and Emergency Response Plan as specified below.
  - .4 On-site Communication Plan as specified below.
  - .5 Name of Contractor's designated Health & Safety Site Representative and information showing proof of his/her competence and reporting relationship in Contractor's company.
  - .6 This designated Health & Safety Site Representative, in addition to their regular duties, will act as Health and Safety Supervisor and be responsible for implementing, enforcing and monitoring health and safety provisions.
  - .7 Names, competence and reporting relationship of other supervisory personnel used in the Work for occupational health and safety purposes.
- .3 On-site Contingency and Emergency Response Plan shall include:
  - .1 Operational procedures, evacuation measures and communication process to be implemented in the event of an emergency.
  - .2 Name, duties and responsibilities of persons designated as Emergency Warden(s) and deputies.
  - .3 Emergency Contacts: name and telephone number of officials from:
    - .1 General Contractor and subcontractors.

- .2 Pertinent Federal and Provincial Departments and Authorities having jurisdiction.
- .3 Local emergency resource organizations.
- .4 On-site Communication Plan:
  - .1 Procedures for sharing of work related safety information to workers and subcontractors, including emergency and evacuation measures.
  - .5 Address all activities of the Work including those of subcontractors.
  - .6 Review Health and Safety Plan regularly during the Work. Update as conditions warrant to address emerging risks and hazards, such as whenever new trade or subcontractor arrive at Work Site.
  - .7 Departmental Representative will respond in writing, where deficiencies or concerns are noted and may request re-submission of the Plan with correction of deficiencies or concerns.
  - .8 Post copy of the Plan, and updates, prominently on Work Site.

#### 1.15 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of New Brunswick.

#### 1.16 SAFETY SUPERVISION

- .1 Employ Health & Safety Site Representative responsible for daily supervision of health and safety of the Work.
- .2 Health & Safety Site Representative may be the Superintendent of the Work or other person designated by Contractor and shall be assigned the responsibility and authority to:
  - .1 Implement, monitor and enforce daily compliance with health and safety requirements of the Work
  - .2 Monitor and enforce Contractor's site-specific Health and Safety Plan.
  - .3 Conduct site safety orientation session to persons granted access to Work Site.
  - .4 Ensure that persons allowed site access are knowledgeable and trained in health and safety pertinent to their activities at the site or are escorted by a competent person while on the Work Site.
  - .5 Stop the Work as deemed necessary for reasons of health and safety.
- .3 Health & Safety Site Representative must:
  - .1 Be qualified and competent person in occupational health and safety.
  - .2 Have site-related working experience specific to activities of the Work.
  - .3 Be on Work Site at all times during execution of the Work.
- .4 All supervisory personnel assigned to the Work shall also be competent persons.

- 
- .5 Inspections:
    - .1 Conduct regularly scheduled safety inspections of the Work on a minimum bi-weekly basis. Record deficiencies and remedial action taken.
  - 1.17 TRAINING
    - .1 Use only skilled workers on Work Site who are effectively trained in occupational health and safety procedures and practices pertinent to their assigned task.
    - .2 Maintain employee records and evidence of training received. Make data available to Departmental Representative upon request.
    - .3 When unforeseen or peculiar safety-related hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Departmental Representative verbally and in writing.
  - 1.18 MINIMUM SITE SAFETY RULES
    - .1 Notwithstanding requirement to abide by federal and provincial health and safety regulations; ensure the following minimum safety rules are obeyed by persons granted access to Work Site:
      - .1 Wear appropriate PPE pertinent to the Work or assigned task; minimum being hard hat, safety footwear, safety glasses and hearing protection.
      - .2 Immediately report unsafe condition at site, near-miss accident, injury and damage.
      - .3 Maintain site and storage areas in a tidy condition free of hazards causing injury.
      - .4 Obey warning signs and safety tags.
    - .2 Brief persons of disciplinary protocols to be taken for non compliance. Post rules on site.
  - 1.19 CORRECTION OF NON-COMPLIANCE
    - .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
    - .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
    - .3 Departmental Representative will stop Work if non-compliance of health and safety regulations is not corrected in a timely manner.
  - 1.20 INCIDENT REPORTING
    - .1 Investigate and report the following incidents to Departmental Representative:
      - .1 Incidents requiring notification to Provincial Department of Occupational Safety and Health, Workers Compensation Board or to other regulatory Agency.
      - .2 Medical aid injuries.

- .3 Property damage in excess of \$10,000.00,
  - .4 Interruptions to Facility operations resulting in an operational lost to a Federal department in excess of \$5000.00.
  - .2 Submit report in writing.
- 1.21 HAZARDOUS PRODUCTS
- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS).
  - .2 Keep MSDS data sheets for all products delivered to site.
    - .1 Post on site.
    - .2 Submit copy to Departmental Representative.
- 1.22 CONFINED SPACES
- .1 Abide by occupational health and safety regulations regarding work in confined spaces.
- 1.23 SITE RECORDS
- .1 Maintain on Work Site copy of safety related documentation and reports stipulated to be produced in compliance with Acts and Regulations of authorities having jurisdiction and of those documents specified herein.
  - .2 Upon request, make available to Departmental Representative or authorized Safety Officer for inspection.
- 1.24 POSTING OF DOCUMENTS
- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on Work Site in accordance with Acts and Regulations of Province having jurisdiction.
  - .2 Post other documents as specified herein, including:
    - .1 Site specific Health and Safety Plan
    - .2 WHMIS data sheets.

END OF SECTION



1.1 DEFINITIONS

- .1 Hazardous Material: Product, substance, or organism that is used for its original purpose; and that is either dangerous goods or a material that may cause adverse impact to the environment or adversely affect health of persons, animals, or plant life when released into the environment.

1.2 FIRES

- .1 Fires and burning of rubbish on site permitted only not permitted.

1.3 DISPOSAL OF WASTES AND HAZARDOUS MATERIALS

- .1 Do not bury rubbish and waste materials on site. Dispose at approved landfill sites as specified in Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
- .2 Do not dispose of hazardous waste or volatile materials, such as mineral spirits, paints, thinners, oil or fuel into waterways, storm or sanitary sewers or waste landfill sites.
- .3 Store, handle and dispose of hazardous materials and hazardous waste in accordance with applicable federal and provincial laws, regulations, codes and guidelines.
- .4 Dispose of construction waste materials and demolition debris, resulting from work, at approved landfill sites only. Carry out such disposal in strict accordance with provincial and municipal rules and regulations. Separate out and prevent improper disposal of items banned from landfills.
- .5 Establish method and undertake construction practices which will minimize waste and optimize use of construction materials. Separate at source, all construction waste materials, demolition debris and product packaging and delivery containers into various waste categories in order to maximize recycling abilities of various materials and avoid disposal of debris at landfill site(s) in a "mixed state". Where recycling firms, specializing in recycling of specific materials exist, transport such materials to the recycling facility and avoid disposal at landfill sites.
- .6 Communicate with landfill operator prior to commencement of work, to determine what specific construction, demolition and renovation waste materials have been banned from disposal at the landfill and at transfer stations.

1.4 DRAINAGE

- .1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.
- .2 Do not pump water containing suspended materials into waterways, sewer or drainage systems.

- 
- .3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with governing regulations and requirements.
  - .4 Pumped water must meet applicable federal, provincial, and municipal standards before it can be discharged to a surface water body. If regulatory guidelines are not met, the Departmental Representative has the right to issue stop pumping instructions to the Contractor. Contractor will not be compensated for any delays associated with retrofitting equipment to meet guidelines.
  - .5 Provide control devices such as filter fabrics, sediment traps and settling ponds to control drainage and prevent erosion of adjacent lands. Maintain in good order for duration of work.
- 1.5 PERMITS
- .1 All guidelines and instructions stated on permits must be strictly adhered to.
- 1.6 WORK ADJACENT TO WATERWAYS
- .1 Do not operate construction equipment in waterways.
  - .2 Do not use waterway beds for borrow material.
  - .3 Do not dump excavated fill, waste material or debris in waterways.
  - .4 At borrow sites, design and construct temporary crossings to minimize erosion to waterways in strict conformance with provincial and federal environmental regulations.
  - .5 Do not skid logs or construction materials across waterways.
  - .6 Avoid indicated spawning beds when constructing temporary crossings of waterways.
  - .7 Do not blast under water or 100 m of spawning beds.
  - .8 Do not refuel any type of equipment within 100 meters of a water body. Maintain equipment in good working condition with no fluid leaks, loose hoses or fittings.
- 1.7 POLLUTION CONTROL
- .1 Maintain temporary erosion and pollution control features installed under this contract.
  - .2 Control emissions from equipment and plant to local authorities emission requirements.
  - .3 Prevent sandblasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.
  - .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads and around entire construction site.

- 
- .5 Maintain inventory of hazardous materials and hazardous waste stored on site. List items by product name, quantity and date when storage began.
  - .6 Have emergency spill response equipment and rapid clean-up kit, appropriate to work, at site. Locate adjacent to work and where hazardous materials are stored. Provide personal protective equipment as required for clean-up.
  - .7 Report, to Federal and Provincial Department of Environment, spills of petroleum and other hazardous materials as well as accidents having potential of polluting the environment. Also notify Departmental Representative and submit a written spill report to Departmental Representative within 24 hours of occurrence.
- 1.8 WILDLIFE PROTECTION
- .1 Should nests of migratory birds in wetlands be encountered during work, immediately notify Departmental Representative for directives to be followed.
    - .1 Do not disturb nest site and neighbouring vegetation until nesting is completed.
    - .2 Minimize work immediately adjacent to such areas until nesting is completed.
    - .3 Protect these areas by following recommendations of Canadian Wildlife Service.

END OF SECTION

Part 1 General

1.1 INSPECTION

- .1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than place of work, allow access to such Work whenever it is in progress.
- .2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of place of Work.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .4 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and replacement.

1.2 INDEPENDENT INSPECTION AGENGENCIES

- .1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative.
- .2 Provide equipment required for executing inspection and testing by appointed agencies.
- .3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and re-inspection.

1.3 ACCESS TO WORK

- .1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.
- .2 Co-operate to provide reasonable facilities for such access.

1.4 PROCEDURES

- .1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.

- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

#### 1.5 REJECTED WORK

- .1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .2 Make good other Contractor's work damaged by such removals or replacements promptly.
- .3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Departmental Representative.

#### 1.6 REPORTS

- .1 Submit 4 copies of inspection and test reports to Departmental Representative.
- .2 Provide copies to subcontractor of work being inspected or tested manufacturer or fabricator of material being inspected or tested.

#### 1.7 MOCK-UPS

- .1 Prepare mock-ups for Work specifically requested in specifications. Include for Work all Sections required to provide mock-ups.
- .2 Construct in locations acceptable to Departmental Representative as specified in specific section.
- .3 Prepare mock-ups for Departmental Representative's review with reasonable promptness and in orderly sequence, to not cause delays of work.
- .4 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .5 If requested, Departmental Representative will assist in preparing schedule fixing dates for preparation.
- .6 Remove mock-ups at conclusion of Work or when acceptable to Departmental Representative.

- .7 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

1.8 MILL TESTS

- .1 Submit adjustment and balancing reports for electrical equipment systems.
- .2 Refer to Sections for definitive requirements.

END OF SECTION

- 
- Part 1            General
- 1.1            ACCESS
- .1          Provide and maintain adequate access to project site.
- .2          Maintain access roads for duration of contract and make good resulting from Contractor's use of road.
- 1.2            MEASUREMENT PROCEDURES
- .1          No measurement for payment will be made for this section. Include associate costs in bid items.
- 1.3            CONTRACTOR'S SITE OFFICE
- .1          Be responsible for and provide own site office, if required, including electricity, heat, lights and telephone. Locate site office as directed by Departmental Representative.
- 1.4            SANITARY FACILITIES
- .1          Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2          Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.
- 1.5            POWER
- .1          Arrange, pay for and maintain temporary electrical power supply in accordance with governing regulations and ordinances.
- .2          Supply and install all temporary facilities for power such as pole lines, underground cables to approval of local power supply authority.
- 1.6            WATER SUPPLY
- .1          Arrange, pay for and maintain temporary water supply in accordance with governing regulations and ordinances.
- 1.7            BARRICADES
- .1          Provide and maintain sufficient barricades, fencing, notices, warning signs, light signals, etc. for the protection of adjoining property and to warn others and workmen engaged on the job of the dangers caused by work.
- .2          Types and location of barricades, etc. to be in accordance with local regulations and to the satisfaction of Departmental Representative.

- .3 The presence of such barricades, lights, etc. shall not relieve the Contractor of the responsibility for any damages.

1.8 SECURITY

- .1 Contractor to make own arrangements for security of his equipment, materials, damages resulting from fire and theft.

1.9 CONSTRUCTION SIGN AND NOTICES

- .1 Contractor or subcontractor advertisement signboards are not permitted on site.
- .2 Only notices of safety or instructions are permitted on site.
- .3 Safety and Instruction Signs and Notices:
  - .1 Signs and notices for safety and instruction shall be in both official languages. Graphic symbols shall conform to CAN3-Z321-96(R2006).
- .4 Maintenance and Disposal of Site Signs:
  - .1 Maintain approved signs and notices in good condition for duration of project and dispose of off site on completion of project or earlier if directed by Departmental Representative.

1.10 REMOVAL OF TEMPORARY FACILITIES

- .1 Remove temporary facilities from site when directed by Departmental Representative.

END OF SECTION



- 
- Part 1            General
- 1.1            INSTALLATION AND REMOVAL
- .1          Provide temporary controls in order to execute work in expeditious manner.
- .2          Remove from site all such work after use.
- 1.2            BARRICADES
- .1          Provide as required by governing authorities.
- 1.3            ACCESS TO SITE
- .1          Provide and maintain access to adjacent harbour facilities.
- 1.4            PUBLIC TRAFFIC FLOW
- .1          Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform work and protect public.
- 1.5            FIRE ROUTES
- .1          Maintain access to property and adjacent wharves, including overhead clearances for use by emergency response vehicles.
- 1.6            PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY
- .1          Protect surrounding private and public property from damage during performance of work.
- .2          Be responsible for damage incurred.
- 1.7            WASTE MANAGEMENT AND DISPOSAL
- .1          Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

END OF SECTION

Part 1 General

1.1 GENERAL

- .1 Use new material and equipment unless otherwise specified.
- .2 Within 7 days of written request by Departmental Representative, submit following information for any materials and products proposed for supply:
  - .1 Name and address of manufacturer.
  - .2 Trade name, model and catalogue number.
  - .3 Performance, descriptive and test data.
  - .4 Compliance to specified standards.
  - .5 Manufacturer's installation or application instructions.
  - .6 Evidence of arrangements to procure.
  - .7 Evidence of manufacturer delivery problems or unforeseen delays.
- .3 Provide material and equipment of specified design and quality, performing to published ratings and for which replacement parts are readily available.
- .4 Use products of one manufacturer for equipment or material of same type or classification unless otherwise specified.
- .5 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.
- .6 Within text of each specification Section, references may be made to reference standards.
- .7 Conform to these reference standards, in whole or in part as specifically requested in specifications.
- .8 If there are any questions to whether products or systems are in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.

1.2 PRODUCT QUALITY AND REFERENCED STANDARDS

- .1 Contractor shall be solely responsible for submitting relevant technical data and independent test reports to confirm whether a product or system proposed for use meets contract requirements and specified standards.
- .2 Final decision as to whether a product or system meets contract requirements rest solely with the Departmental Representative in accordance with the General Conditions.

- .3 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .4 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.
- .5 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .6 Should disputes arise as to quality or fitness of products, decision rests strictly with Consultant based upon requirements of Contract Documents.
- .7 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .8 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

### 1.3 AVAILABILITY

- .1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Departmental Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.
- .2 In event of failure to notify Departmental Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

### 1.4 ACCEPTABLE MATERIALS AND ALTERNATIVES

- .1 Where materials are specified by trade names, trademarks or manufacturers, when so listed in the various sections of the Specification or added into the Contract Documents by addendum, select one of the names listed for use on project.
- .2 In accordance with Clause 15 of the General Instructions to Bidders, Document No. R2710T, submission of alternative materials to those trade names or manufacturers listed in the contract documents as acceptable materials, must be done during the bidding period following procedures indicated therein.
- .3 Note that Document R2710T is incorporated by reference into, and forms part of the Bid and Contract Documents.

---

1.5 MANUFACTURERS INSTRUCTIONS

- .1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods to be used. Do not rely on labels or enclosure provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Departmental Representative in writing of any conflict between these specifications and manufacturer's instructions, so that Departmental Representative will designate which document is to be followed.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Department Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

1.6 AVAILABILITY

- .1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Departmental Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.
- .2 Immediately notify Departmental Representative in writing of unforeseen or unanticipated material delivery problems by manufacturer. Provide support documentation as per clause 1.1.2.6 above.
- .3 In event of failure to notify Departmental Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.7 WORKMANSHIP

- .1 Ensure quality of work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Department Representative if required work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. The Department Representative and Consultant reserves right to require dismissal from site, workers deemed incompetent or careless.
- .3 Decisions as to standard of fitness of quality or work in cases of dispute rest solely with Departmental Representative whose decision is final.
- .4 Remove unsuitable or incompetent workers from site as stipulated in the General Conditions.
- .5 Ensure cooperation of workers in laying out work. Maintain efficient and continuous supervision on site at all times.

- 
- .6 Coordinate work between trades and subcontractors. See section 01 14 10 in this regard.
  - .7 Coordinate placement of openings, sleeves and accessories.
- 1.8 FASTENINGS – GENERAL
- .1 Keep exposed fastenings to minimum, space evenly and lay out neatly.
  - .2 Fastenings which cause spalling or cracking of material to which anchorage is made, are not acceptable.
- 1.9 FASTENINGS – EQUIPMENT
- .1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.
  - .2 Use heavy hexagon heads, semi-finished unless otherwise specified.
  - .3 Bolts may not project more than one diameter beyond nuts.
  - .4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur and, use resilient washers with stainless steel.
  - .5 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.
  - .6 Prevent electrolytic action between dissimilar metals and materials.
  - .7 Use non-corrosive hot dip galvanized or 316 stainless steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.
  - .8 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.
  - .9 Keep exposed fastenings to a minimum, space evenly and install neatly.
  - .10 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.
- 1.10 STORAGE, HANDLING AND PROTECTION
- .1 Deliver, handle and store materials in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.

- .2 Store packaged or bundled materials in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work. Provide additional cover where manufacturer's packaging is insufficient to provide adequate protection.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 Store sheet materials on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .6 Immediately remove damaged or rejected materials from site.
- .7 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative and Consultant.
- .8 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.11 TRANSPORTATION

- .1 Pay costs of transportation of products required in performance of Work.

END OF SECTION

Part 1            General

1.1                GENERAL

- .1            Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
- .2            Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .3            Prevent accumulations of wastes which create of each working day.
- .4            Provide adequate ventilation during use of volatile or noxious substances.

1.2                MATERIALS

- .1            Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

1.3                CLEANING DURING CONSTRUCTION

- .1            Maintain project grounds and public properties in a tidy condition, free from accumulations of waste material and debris. Clean areas on a daily basis.
- .2            Provide on-site garbage containers for collection of waste materials and debris.
- .3            Remove waste materials, and debris from site on a daily basis.

1.4                FINAL CLEANING

- .1            In preparation for acceptance of the Work performs final cleaning.
- .2            Inspect finishes, fitments and equipment. Ensure specified workmanship and operation.
- .3            Broom clean exterior paved and concrete surfaces; rake clean other surfaces of grounds.

END OF SECTION

Part 1            General

1.1                DISPOSAL OF WASTE

- .1            Separate and recycle waste materials designated for disposal.
- .2            Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard and packaging material in appropriate on-site bids for recycling.
- .3            Place materials defined as hazardous or toxic in designated containers.
- .4            Divert unused metal materials from landfill to metal recycling facility as approved by Departmental Representative.
- .5            Fold up metal banding, flatten and place in designated area for recycling.
- .6            Unused paint or coating material must be disposed of at an official hazardous material collections site as approved by Departmental Representative.
- .7            Do not dispose of unused paint material into sewer system, streams, lakes, onto ground, or in any other location where it will pose a health or environmental hazard.
- .8            Disposal of waste volatile materials, mineral spirits, oil, and paint thinner into waterways, storm, or sanitary sewers is strictly prohibited.
- .9            Dispose of unused material at an official hazardous material collections site. Do not dispose of unused hazardous material into the sewer system, streams, lakes, on ground or in any other location where they will pose a health or environmental hazard.
- .10           Do not dispose of preservative treated wood through incineration.
- .11           Do not dispose of preservative treated wood with other materials destined for recycling or reuse.
- .12           Dispose of treated wood, end pieces, wood scraps and sawdust at a sanitary landfill.
- .13           Dispose of unused preservative material at an official hazardous material collections site. Do not dispose of unused preservative material into the sewer system, streams, and lakes, on ground or in any other location where they will pose a health or environmental hazard.
- .14           Burying of rubbish and waste materials is prohibited.
- .15           All waste material not designated for recycle to be disposed of at an approved waste disposal site in accordance with appropriate environmental guidelines.



1.2 STORAGE AND HANDLING OF WASTE

- .1 Store materials to be reused, recycled and salvaged in locations as directed by Departmental Representative.
- .2 Unless specified otherwise, materials for removal become property of the Contractor.
- .3 Protect, stockpile, store and catalogue salvaged items.
- .4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.

Part 2 Not Used

Part 3 Execution

3.1 APPLICATION

- .1 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

3.2 CLEANING

- .1 Remove tools and waste materials on completion of work and leave work area in clean and orderly condition.
- .2 Clean-up work area as work progresses.
- .3 Source separate materials to be reused or recycled into specific sort areas.

3.3 DIVERSION OF MATERIALS

- .1 Separate materials from general waste and stockpile in separate piles or containers, to approval of Departmental Representative, and consistent with applicable fire regulations. Mark containers or stockpile areas. Provide instruction on disposal practices.
- .2 On-site sale of salvaged, recovered, reusable, or recyclable materials is not permitted.

END OF SECTION

- 
- Part 1            General
- 1.1            RELATED SECTIONS
- .1            Division 01 – General Requirements.
- 1.2            REFERENCES
- .1            Canadian Standards Association (CSA International)
- .1            CSA C22.1-12, Canadian Electrical Code (CEC), Part 1 (22<sup>nd</sup> Edition), Safety Standard for Electrical Installations.
- .2            CAN/CSA-C22.3 No. 7-10, Underground Systems.
- .3            CAN3-C235-83(R2000), Preferred Voltage Levels for AC Systems, 0 to 50,000 V.
- .4            CSA Z462-12, Workplace Electrical Safety.
- .2            Electrical and Electronic Manufacturer's Association of Canada (EEMAC)
- .1            EEMAC Y1-2-1979, Performance Specifications for Finishing Systems for Outdoor Electrical Equipment.
- .2            EEMAC 2Y-1-1958, Light Gray Colour for Indoor Switch Gear.
- .3            Institute of Electrical and Electronics (IEEE)/National Electrical Safety Code Product Line (NESC)
- .1            IEEE SP1122-2000, The Authoritative Dictionary of IEEE Standards Terms, 7th Edition.
- 1.3            DEFINITIONS
- .1            Electrical and electronic terms: unless otherwise specified or indicated, terms used in these specifications, and on drawings, are those defined by IEEE SP1122.
- 1.4            DESIGN REQUIREMENTS
- .1            Operating voltages: to CAN3-C235.
- .2            Control and distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard.
- .1            Equipment to operate in extreme operating conditions established in above standard without damage to equipment.
- .3            Language operating requirements: provide identification nameplates and labels for control items in English.

- 
- 1.5 ACTION AND INFORMATION SUBMITTALS
- .1 Submittals: in accordance with Section 01 33 00 – Shop Drawings and Other Submittal Procedures.
  - .2 Submit to Technical Inspection Services, Department of Public Safety necessary number of drawings and specifications for examination and approval prior to commencement of work. Pay all associated fees.
  - .3 Product Data: submit WHMIS MSDS in accordance with Section 01 35 29 – Health and Safety Requirements.
  - .4 Shop drawings:
    - .1 Submit manufacturer shop drawings of all equipment.
    - .2 Submit wiring diagrams and installation details of equipment indicating proposed location, layout and arrangement, accessories and other items that must be shown to ensure co-ordinated installation.
    - .3 Identify on wiring diagrams circuit terminals and indicate internal wiring for each item of equipment and interconnection between each item of equipment.
    - .4 Indicate on drawings clearances for operation, maintenance, and replacement of operating equipment devices.
    - .5 If changes are required, resubmit corrected drawings.
  - .5 Quality Control: in accordance with Section 01 45 00 – Quality Control.
    - .1 Provide CSA certified equipment and material.
    - .2 Where CSA certified equipment and material is not available, submit such equipment and material to inspection authorities for special approval before delivery to site.
    - .3 Submit test results of installed electrical systems and instrumentation.
    - .4 Permits and fees: in accordance with General Conditions of contract.
    - .5 Submit, upon completion of Work, load balance report as described in PART 3 – FIELD QUALITY CONTROL.
    - .6 Submit certificate of acceptance from authority having jurisdiction upon completion of Work to Departmental Representative.
  - .6 Upon completion of project, submit as-built drawings and maintenance manuals.
- 1.6 QUALITY ASSURANCE
- .1 Quality Assurance: in accordance with Section 01 45 00 – Quality Control.
  - .2 Qualifications: electrical Work to be carried out by qualified, licensed electricians or apprentices in accordance with authorities having jurisdiction as per the conditions of Provincial Act respecting manpower vocational training and qualification.
    - .1 Employees registered in provincial apprentices program: permitted, under direct supervision of qualified licensed electrician, to perform specific tasks.

- 
- .2 Permitted activities: determined based on training level attained and demonstration of ability to perform specific duties.
  - .3 Site Meetings:
    - .1 Site Meetings: as part of Field Services described in Part 3 - FIELD QUALITY CONTROL, schedule site visits, to review Work, at stages listed.
      - .1 After delivery and storage of products, and when preparatory Work is complete but before installation begins.
      - .2 Twice during progress of Work at 25% and 60% complete.
      - .3 Upon completion of Work, after cleaning is carried out.
    - .4 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements.
- 1.7 DELIVERY, STORAGE AND HANDLING
- .1 Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements.
  - .2 Separate and recycle waste materials in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
    - .1 Separate waste materials for reuse and recycling.
    - .2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- 1.8 SYSTEM STARTUP
- .1 Instruct Departmental Representative and operating personnel in operation, care and maintenance of systems, system equipment and components.
  - .2 Arrange and pay for services of manufacturer's factory service engineer to supervise start-up of installation, check, adjust, balance and calibrate components and instruct operating personnel.
  - .3 Provide these services for such period, and for as many visits as necessary to put equipment in operation, and ensure that operating personnel are conversant with aspects of its care and operation.
- 1.9 OPERATING INSTRUCTIONS
- .1 Provide for each system and principal item of equipment as specified in technical sections for use by operation and maintenance personnel.

- 
- .2 Operating instructions to include following:
    - .1 Wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment.
    - .2 Start up, proper adjustment, operating, lubrication, and shutdown procedures.
    - .3 Safety precautions.
    - .4 Procedures to be followed in event of equipment failure.
    - .5 Other items of instruction as recommended by manufacturer of each system or item of equipment.
  - .3 Print or engrave operating instructions and frame under glass or in approved laminated plastic.
  - .4 Post instructions where directed.
  - .5 For operating instructions exposed to weather, provide weather-resistant materials or weatherproof enclosures.
  - .6 Ensure operating instructions will not fade when exposed to sunlight and are secured to prevent easy removal or peeling.
- 1.10 SITE VISIT
- .1 Prior to tender submission, visit the site and become familiar with the job and all conditions which may affect costs. Ignorance of existing conditions will not be considered as basis for extra claims.
- 1.11 MEASUREMENT FOR PAYMENT
- .1 Electrical will be measured by lump sum.
- Part 2 Products
- 2.1 MATERIALS AND EQUIPMENT
- .1 Provide material and equipment in accordance with Section 01 61 00 - Common Product Requirements.
  - .2 Material and equipment to be CSA certified. Where CSA certified material and equipment are not available, obtain special approval from inspection authorities before delivery to site and submit such approval as described in PART 1 - SUBMITTALS.
  - .3 Factory assemble control panels and component assemblies.
- 2.2 ELECTRIC EQUIPMENT AND CONTROLS
- .1 Verify installation and co-ordination responsibilities related to equipment and controls, as indicated. Verify size, location and wiring requirements of all equipment with appropriate trade and reviewed shop drawings prior to rough-in.

- 
- .2 Provide wiring and conduit.
- 2.3 WARNING SIGNS
- .1 Warning Signs: in accordance with requirements of authority having jurisdiction Departmental Representative.
  - .2 Decal signs, minimum size 175 x 250 mm.
- 2.4 WIRING TERMINATIONS
- .1 Ensure lugs, terminals, screws used for termination of wiring are suitable for either copper or aluminum conductors.
- 2.5 EQUIPMENT IDENTIFICATION
- .1 Identify electrical equipment with nameplates and labels as follows:
    - .1 Nameplates: plastic laminate lamicaid 3 mm thick plastic engraving sheet, matte white finish face, black core, lettering accurately aligned and engraved into core and mechanically attached with 3M VHB acrylic adhesive type 4941.
    - .2 Sizes as follows:
- | 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  |
- .2 Labels: embossed plastic labels with 6 mm high letters unless specified otherwise.
  - .3 Wording on nameplates and labels to be approved by Departmental Representative prior to manufacture.
  - .4 Allow for minimum of twenty-five (25) letters per nameplate.
  - .5 Nameplates for terminal cabinets and junction boxes to indicate system and/or voltage characteristics.
  - .6 Lamicaid nameplate installed on distribution panelboards, meter centers, circuit breaker enclosures and power modules shall indicate the following:
    - .1 Designated name of equipment.
    - .2 Overcurrent protection device rating.
    - .3 Voltages, number of phases and wires.
    - .4 Designation of power source.

.5 The following is an example.

PANEL D1 – 400A 120/208V – 3PH – 4W FED FROM TRANSFORMER: TX1
---

- .7 Lamicoïd nameplates installed on manual starters, control panels, disconnect switches, large junction and pull boxes, service equipment and service modules shall contain the following information:
- .1 Designated name of equipment.
  - .2 Designated name of power source.
  - .3 Voltage(s), number of phases and wires.
  - .4 Branch circuit breaker number(s) where possible.
- .8 All junction and/or pull boxes (volume less than 8500 cu cm) shall be marked with an indelible ink marker to designate the circuit number of enclosed wiring, the designated panel name and electrical characteristics where applicable.
- .9 Install an additional lamicoïd nameplate on all, or any piece of electrical equipment, or apparatus, i.e. panelboards and fusible switches, etc. that may contain overcurrent devices, i.e. circuit breakers and/or fuses, that have been designed for, and incorporate an interrupting capacity sized “larger” than 10 KAIC.

Example:

Minimum interrupting capacity of breakers installed in this panel is to be not less than 14 KAIC	Minimum interrupting capacity of fuses installed in this fusible switch is to be not less than 100 KAIC
--	---

## 2.6 WIRING IDENTIFICATION

- .1 Identify wiring with permanent indelible identifying markings, indicating panel and circuit number; i.e., D2-31. Normal ground circuits to have ground, neutral and phase wires identified with black on white background tape. Tape to be preprinted vinyl, self-adhesive. Circuits to be identified a both ends and at all pull and junction boxes.
- .2 Use coloured plastic tapes to identify feeders on both ends of phase conductors and at junction and pull boxes if conductor insulation colours are other than red, black, blue, white and green.
- .3 Maintain phase sequence and colour coding throughout.
- .4 Colour coding: to CSA C22.1.
- .5 Use colour coded wires in communication cables, matched throughout system.

---

2.7 FINISHES

- .1 Shop finish metal enclosure surfaces by application of rust resistant primer inside and outside, and at least two coats of finish enamel.
  - .1 Paint distribution enclosures light grey to EEMAC 2Y-1.

Part 3 Execution

3.1 INSTALLATION

- .1 Do complete installation in accordance with CSA C22.1 except where specified otherwise.
- .2 Do underground systems in accordance with CSA C22.3 No.1 except where specified otherwise.

3.2 CUTTING AND PATCHING

- .1 Provide cutting, coring and drillings as required for installation of electrical services. Hole sizes to be kept to a minimum. Restoration of damaged surfaces to preconstruction condition will be by this contractor.

3.3 NAMEPLATES AND LABELS

- .1 Ensure manufacturer's nameplates, CSA labels and identification nameplates are visible and legible after equipment is installed.

3.4 CONDUIT AND CABLE INSTALLATION

- .1 Install cables, conduits and fittings embedded in structure as indicated.

3.5 LOCATION OF OUTLETS AND EQUIPMENT

- .1 Locate outlets in accordance with Section 26 05 32 - Outlet Boxes, Conduit Boxes and Fittings.
- .2 Change location of outlets and equipment at no extra cost or credit, providing distance does not exceed 3000 mm, and information is given before installation.

3.6 MOUNTING HEIGHTS

- .1 Mounting height of equipment is from finished floor to centreline of equipment unless specified or indicated otherwise.
- .2 If mounting height of equipment is not indicated, verify before proceeding with installation.
- .3 Refer to all detail drawings and confirm mounting of outlet boxes prior to roughing-in.



- 
- 3.7 CO-ORDINATION OF PROTECTIVE DEVICES
- .1 Ensure circuit protective devices such as overcurrent trips, relays and fuses are installed to required values and settings.
- 3.8 FIELD QUALITY CONTROL
- .1 Load Balance:
- .1 Measure phase current to panelboards with normal loads (lighting) operating at time of acceptance; adjust branch circuit connections as required to obtain best balance of current between phases and record changes.
- .2 Provide upon completion of work, load balance report as directed in PART 1 - SUBMITTALS: phase and neutral currents on panelboards, operating under normal load, as well as hour and date on which each load was measured, and voltage at time of test.
- .2 Conduct following tests in accordance with Section 01 45 00 – Quality Control.
- .1 Power distribution system including phasing, voltage, grounding and load balancing.
- .2 Circuits originating from branch distribution panels.
- .3 Lighting and its control.
- .4 Insulation resistance testing:
- .1 Megger circuits, feeders and equipment up to 350 V with a 500 V instrument.
- .2 Check resistance to ground before energizing.
- .3 Carry out tests in presence of Departmental Representative.
- .4 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.
- 3.9 CLEANING
- .1 Clean and touch up surfaces of shop-painted equipment scratched or marred during shipment or installation, to match original paint.

END OF SECTION

- 
- Part 1            General
- 1.1            DESCRIPTION OF WORK
- .1            In general, work of this Section consists of the removal and replacement of electrical receptacles and luminaires on existing wharf as noted.
- 1.2            RELATED SECTIONS
- .1            Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2            Section 26 05 00 – Common Work Results for Electrical.
- 1.3            SITE SURVEY
- .1            Prior to Tender submission, visit the site and survey and Quantify the extent of the removals/alterations required for this contract and include all costs in the total tendered price.
- 1.4            REFERENCE STANDARDS
- .1            All removal and alteration work of electrical construction to be done in accordance with the safety standards outlined in the Canadian Electrical Code.
- 1.5            PROTECTION
- .1            The contractor is responsible for any damages to existing structure as a result of the work.
- Part 2            Products
- 2.1            Not Applicable
- Part 3            Execution
- 3.1            GENERAL REMOVALS
- .1            Remove existing electrical services as noted. This includes any utility services identified to be removed
- .2            Pay any Utility fees for removal of Utility services.
- .3            Schedule all removal work with the Departmental Representative. Do not disrupt wharf operations.

END OF SECTION

- 
- Part 1            General
- 1.1            RELATED SECTIONS
- .1            Section 26 05 00 – Common Work Results for Electrical.
- 1.2            REFERENCES
- .1            Canadian Standards Association (CSA International)
- .1            CAN/CSA-C22.2No.18-98, Outlet Boxes, Conduit Boxes, Fittings and  
                          Associated Hardware.
- .2            CSA C22.2No.65-03(R2008), Wire Connectors (Tri National Standard with UL  
                          486A-486B and NMX-J-543-ANCE-03.
- .2            Electrical and Electronic Manufacturers' Association of Canada (EEMAC)
- .1            EEMAC 1Y-2, 1961 Bushing Stud Connectors and Aluminum Adapters (1200  
                          Ampere Maximum Rating).
- .3            National Electrical Manufacturers Association (NEMA)
- 1.3            ACTION AND INFORMATIONAL SUBMITTALS
- .1            Submit shop drawings in accordance with Section 01 33 00 – Shop Drawings and Other  
                          Submittal Procedures.
- .2            Shop Drawings to include manufacturer's instructions, printed product literature and data  
                          sheets including characteristics, physical size, finish and limitations.
- 1.4            DELIVERY STORAGE AND HANDLING
- .1            Deliver, store and handle materials in accordance with Section 01 61 00 – Common  
                          Product Requirements.
- .2            Separate and recycle waste materials in accordance with Section 01 74 21 –  
                          Construction/Demolition Waste Management and Disposal.
- .1            Separate waste materials for reuse and recycling.
- .2            Remove from site and dispose of all packaging materials at appropriate recycling  
                          facilities.

Part 2 Products

2.1 MATERIALS

- .1 Crimp style wire connectors, nylon insulated, with current carrying parts of copper alloy, for conductors #16 AWG and smaller.
- .2 Fork tongue, nylon insulated, crimp style terminals for connecting conductors #16 AWG and smaller to screw down terminals.
- .3 Pressure type wire connectors to: CAN/CSA-C22.2 No.65, with current carrying parts of copper alloy sized to fit copper conductors as required. Use twist-on connectors for #14 AWG to #8 AWG wires.
- .4 Crimp style wire connectors, nylon insulated with current carrying parts of copper alloy, for connecting solid to stranded conductors.
- .5 Compression type connectors or terminal blocks in suitable enclosure for connecting #6 AWG conductors and larger, unless indicated otherwise. Compression type connectors to have a temperature rating of 90 deg. C.
- .6 Fixture type splicing connectors to: CAN/CSA-C22.2 No.65, with current carrying parts of copper alloy sized to fit copper conductors 10 AWG or less.
- .7 Bushing stud connectors: to EEMAC 1Y-2 to consist of:
  - .1 Connector body and stud clamp for stranded round copper or aluminum conductors.
  - .2 Clamp for stranded round copper conductors.
  - .3 Stud clamp bolts.
  - .4 Bolts for copper conductors.
  - .5 Sized for conductors as indicated.
- .8 Waterproof gel filled twist-on type wire connectors to: CAN/CSA-C22.2 No.65 and UL486D, with current carrying parts of copper alloy sized to fit copper conductors as required.
  - .1 Suitable for use in damp, wet, raintight and submersible locations.
  - .2 Temperature rating: 105 deg. C.
  - .3 Silicone sealant temperature: -43 deg. C to 204 deg. C.
  - .4 Acceptable materials:
    - .1 King Innovation: Dryconn waterproof connectors.
    - .2 Ideal "Underground" connectors.

- .9 Teck Connectors:
  - .1 Watertight, copper free aluminum approved for TECK cable.
  - .2 Acceptable materials:
    - .1 Thomas & Betts StarTeck.
    - .2 Iberville Tek Series.
- .10 Cold Weather Tape:
  - .1 Acceptable materials:
    - .1 Scotch Brand '88'.

Part 3 Execution

3.1 INSTALLATION

- .1 Remove insulation carefully from ends of conductors and:
  - .1 Install mechanical pressure type connectors and tighten screws with appropriate compression tool recommended by manufacturer. Installation shall meet secureness tests in accordance with CSA C22.2No.65.
  - .2 Install gel filled twist-on type connectors for lighting and receptacle circuit splice locations and tighten.
  - .3 Install bushing stud connectors in accordance with EEMAC 1Y-2.
  - .4 Wrap connectors in junction boxes with double half lapped layer of cold weather tape.

3.2 RESTRICTIONS

- .1 No splices are allowed in panelboards or in equipment enclosures unless noted otherwise.

END OF SECTION

- 
- Part 1            General
- 1.1            RELATED SECTIONS
- .1          Section 26 05 00 – Common Work Results for Electrical.
- .2          Section 26 05 20 – Wire and Box Connectors (0 - 1000V).
- .3          Section 26 05 34– Conduits, Conduit Fastenings and Conduit Fittings
- 1.2            REFERENCES
- .1          CSA C22.2 No. 0.3-96, Test Methods for Electrical Wires and Cables.
- 1.3            ACTION AND INFORMATIONAL SUBMITTALS
- .1          Submit shop drawings in accordance with Section 01 33 00 – Shop Drawings and Other Submittal Procedures.
- .2          Shop Drawings to include manufacturer's instructions, printed product literature and data sheets including characteristics, physical size, finish and limitations.
- 1.4            DELIVERY STORAGE AND HANDLING
- .1          Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements.
- .2          Separate and recycle waste materials in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal:
- .1          Separate waste materials for reuse and recycling.
- .2          Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- Part 2           Products
- 2.1            WIRES
- .1          Conductors: stranded for 8 AWG and larger. Minimum size: 12 AWG.
- .2          Copper conductors: size as indicated, with 600V insulation of chemically cross-linked thermosetting polyethylene material rated RW90.
- 2.2            TECK CABLE
- .1          Cable: to CAN/CSA-C22.2 No. 131.

- 
- .2 Conductors:
    - .1 Grounding conductor: copper.
    - .2 Circuit conductors: copper, size as indicated.
  - .3 Insulation:
    - .1 Chemically cross-linked thermosetting polyethylene rated type RW90, 600V.
  - .4 Inner jacket: polyvinyl chloride material.
  - .5 Armour: flat interlocking aluminum.
  - .6 Overall covering: thermoplastic polyvinyl chloride material.
  - .7 Fastenings:
    - .1 One hole steel straps to secure surface cables 50 mm and smaller. Two hole steel straps for cables larger than 50 mm.
    - .2 Channel type supports for two or more cables at 1500 mm centers.
    - .3 Threaded rods: 6 mm dia. to support suspended channels.
  - .8 Connectors:
    - .1 Watertight approved for TECK cable.
- 2.3 SPECIALTY COILING CABLE
- .1 Cable: to CAN/CSA-C22.2.
  - .2 Conductors:
    - .1 Grounding conductor: copper.
    - .2 Circuit conductors: copper, size as indicated.
  - .3 Insulation:
    - .1 Polyurethane: chemical and abrasion resistant, rated 300V.
  - .4 Flexible from -50deg C to 80 deg C., with coil retention up to 5 years.
  - .5 4 conductor #12 AWG, with a minimum rating of 15A @120V.
  - .6 5: 1 ratio with an extended coil of 7.6 meters.
  - .7 Lead lengths of 4 meters on each end.
  - .8 Acceptable materials:
    - .1 Cable Science type PCE.

---

Part 3 Execution

3.1 INSTALLATION OF WIRES

.1 Install wiring as follows:

- .1 In conduit systems in accordance with Section 26 05 34 – Conduits, Conduit Fastenings and Conduit Fittings.

3.2 INSTALLATION OF TECK CABLE 0 -1000 V

.1 Install cables, fastened in place at 1200mm intervals.

.2 Terminate cables in accordance with Section 26 05 20- Wire and Box Connectors (0 - 1000V).

3.3 INSTALLATION OF COILING CABLE 0 -1000 V

.1 Install cables and support using Kellems stainless steel fittings with stainless steel mesh at both ends.

.2 Ensure cable does not fall below floating dock when fully extended.

END OF SECTION



- 
- Part 1            General
- 1.1            RELATED SECTIONS
- .1            Section 26 05 00 - Common Work Results for Electrical.
- 1.2            REFERENCES
- .1            American National Standards Institute (ANSI)/Institute of Electrical and Electronics Engineers (IEEE)
- .1            ANSI/IEEE 837-02 Standard for Qualifying Permanent Connections Used in Substation Grounding.
- .2            Canadian Standards Association, (CSA International)
- .1            CSA C22.2 No.41-07 (R2012), Grounding and Bonding Equipment (Bi-National Standard with UL 467).
- 1.3            ACTION AND INFORMATIONAL SUBMITTALS
- .1            Submit shop drawings in accordance with Section 01 33 00 – Shop Drawings and Other Submittal Procedures.
- .2            Shop Drawings to include manufacturer's instructions, printed product literature and data sheets including characteristics, physical size, finish and limitations.
- 1.4            DELIVERY STORAGE AND HANDLING
- .1            Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements.
- .2            Separate and recycle waste materials in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
- .1            Separate waste materials for reuse and recycling.
- .2            Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- Part 2            Products
- 2.1            EQUIPMENT
- .1            Grounding conductors: bare stranded copper, tinned, soft annealed, size as indicated.
- .2            Insulated grounding conductors: green, type RW90 minimum size #12AWG.
- .3            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.

Part 3 Execution

3.1 INSTALLATION GENERAL

- .1 Install complete permanent, continuous grounding system including, rod electrodes, conductors, connectors, accessories. Install an insulated ground wire in all conduits.
- .2 Install connectors in accordance with manufacturer's instructions.
- .3 Protect exposed grounding conductors from mechanical injury.
- .4 Use mechanical connectors for grounding connections to equipment provided with lugs.
- .5 Soldered joints not permitted.
- .6 Make grounding connections in radial configuration only, with connections terminating at single point. Avoid loop connections.

3.2 SYSTEM AND CIRCUIT GROUNDING

- .1 Install system and circuit grounding connections to neutral of secondary 600 V and 208 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, distribution panels, outdoor lighting.

3.4 FIELD QUALITY CONTROL

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Perform ground continuity and resistance tests using method appropriate to site conditions and to approval of Departmental Representative and local authority having jurisdiction over installation.
- .3 Perform tests before energizing electrical system.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 26 05 00 – Common Work Results for Electrical.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit shop drawings in accordance with Section 01 33 00 – Shop Drawings and Other Submittal Procedures.
- .2 Shop Drawings to include manufacturer's instructions, printed product literature and data sheets including characteristics, physical size, finish and limitations.

1.3 DELIVERY STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements.
- .2 Separate and recycle waste materials in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
  - .1 Separate waste materials for reuse and recycling.
  - .2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

Part 2 Products

2.1 SUPPORTS

- .1 U shape, size 41 x 41 x 2.5 mm, corrosion resistant PVC coated punched channel.
- .2 9.5 mm dia PVC coated corrosion resistant all-thread rods for supporting suspended channel.
- .3 Specific purpose, corrosion resistant PVC coated, heat treated, fasteners to be used to support boxes, conduit and cable from support channel and/or directly from structure.
- .4 Heat patch cure for patching.
- .5 Acceptable manufacturer:
  - .1 Thomas & Betts Ocal.

2.2 MOUNTING HARDWARE

- .1 316 Stainless steel corrosion resistant concrete inserts and mounting hardware to be used.

---

2.3 FLEXIBLE CORD SUPPORT GRIPS

- .1 Heavy duty type.
- .2 Double weave stainless steel mesh grip.
- .3 Grip range to match cable diameter.

Part 3 Execution

3.1 INSTALLATION

- .1 Secure equipment to poured concrete with expandable inserts.
- .2 Secure cables to underside of structure using support channels, surface mounted or suspended and pipe straps for strut.
- .3 Secure surface mounted equipment with stainless steel fasteners.
- .4 Fasten cables installed-vertically on structure using corrosion resistant two-hole PVC coated steel straps complete with stainless steel hardware.
- .5 Install fastenings and supports as required for each type of equipment and cable in accordance with manufacturer's installation recommendations.
- .6 Install flexible cord support grips as indicated and in accordance with manufacturer's instructions. Install on SOW cables in pole mounted luminaires.

3.2 TOUCH-UP

- .1 Any supports that have PVC coating nicked, cut or abraded to be patched using 'heat-cure patch' installed in accordance with manufacturer's recommendations.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 26 05 00 – Common Work Results for Electrical.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
  - .1 CSA C22.1-12, Canadian Electrical Code, Part 1, 22th Edition.
  - .2 CSA C22.2 No. 40-M1989(R2009), Cutout, Junction and Pull Boxes.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit shop drawings in accordance with Section 01 33 00 – Shop Drawings and Other Submittal Procedures.
- .2 Shop Drawings to include manufacturer's instructions, printed product literature and data sheets including characteristics, physical size, finish and limitations.

1.4 DELIVERY STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements.
- .2 Separate and recycle waste materials in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
  - .1 Separate waste materials for reuse and recycling.
  - .2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

Part 2 Products

2.1 JUNCTION AND PULL BOXES

- .1 Construction: 316 stainless steel, CSA 4X rated
- .2 Covers Surface Mounted: Stainless steel hinged covers complete with neoprene gasket.
- .3 Mounting feet.
- .4 Mounting Plate.
- .5 Drilled conduit holes to suit.

.6 Acceptable materials:

- .1 Hoffman
- .2 Hammond
- .3 Rittal

Part 3 Execution

3.1 JUNCTION AND PULL BOXES INSTALLATION

- .1 Install pull boxes in accessible locations as indicated.
- .2 Size and install junction and pull boxes to CSA C22.1.
- .3 Install breather/drain on all junction and pull boxes

3.2 IDENTIFICATION

- .1 Equipment Identification: to Section 26 05 00 - Common Work Results for Electrical.
- .2 Identification Labels: size 2 indicating system name voltage and phase or as indicated.

END OF SECTION

- 
- Part 1            General
- 1.1            RELATED SECTIONS
- .1            Section 26 05 00 - Common Work Results for Electrical.
- 1.2            REFERENCES
- .1            Canadian Standards Association (CSA International)
- .1            CSA C22.1-12, Canadian Electrical Code, Part 1, 22th Edition.
- 1.3            ACTION AND INFORMATIONAL SUBMITTALS
- .1            Submit shop drawings in accordance with Section 01 33 00 – Shop Drawings and Other Submittal Procedures.
- .2            Shop Drawings to include manufacturer's instructions, printed product literature and data sheets including characteristics, physical size, finish and limitations.
- 1.4            DELIVERY STORAGE AND HANDLING
- .1            Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements.
- .2            Separate and recycle waste materials in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
- .1            Separate waste materials for reuse and recycling.
- .2            Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- Part 2            Products
- 2.1            OUTLET AND CONDUIT BOXES GENERAL
- .1            Size boxes in accordance with CSA C22.1.
- .2            102 mm square or larger outlet boxes as required.
- .3            Blank cover plates for boxes without wiring devices.
- 2.2            CONDUIT BOXES
- .1            Cast FS or FD boxes with factory hubs and mounting feet for surface wiring of devices unless noted otherwise.
- .2            Provide gasketed covers for exterior boxes.

---

2.3 FITTINGS - GENERAL

- .1 Bushing and connectors with nylon insulated throats.
- .2 Knock-out fillers to prevent entry of debris.
- .3 Conduit outlet bodies for conduit up to 35 mm and pull boxes for larger conduits.

Part 3 Execution

3.1 INSTALLATION

- .1 Support boxes independently of connecting conduits.
- .2 Fill boxes with sponges or foam or similar approved material to prevent entry of debris during construction. Remove upon completion of work.
- .3 Provide correct size of openings in boxes for conduit and cable connections. Do not install reducing washers.
- .4 Vacuum clean interior of outlet boxes before installation of wiring devices.
- .5 Identify systems for outlet boxes as required.

END OF SECTION



- 
- Part 1            General
- 1.1            RELATED SECTIONS
- .1            Section 26 05 00 – Common Work Results for Electrical.
- 1.2            REFERENCES
- .1            Canadian Standards Association (CSA International)
- .1            CSA C22.2 No. 18.04 (R2009) Hardware for the Support of Conduit, Tubing and Cable.
- .2            CSA C22.2 No. 211.2-06 (R2011), Rigid PVC (Unplasticized) Conduit.
- 1.3            ACTION AND INFORMATIONAL SUBMITTALS
- .1            Submit shop drawings in accordance with Section 01 33 00 – Shop Drawings and Other Submittal Procedures.
- .2            Shop Drawings to include manufacturer's instructions, printed product literature and data sheets including characteristics, physical size, finish and limitations.
- 1.4            DELIVERY STORAGE AND HANDLING
- .1            Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements.
- .2            Separate and recycle waste materials in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
- .1            Separate waste materials for reuse and recycling.
- .2            Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- 1.5            LOCATION OF CONDUITS
- .1            Drawings do not show all conduits. Those shown are in diagrammatic form only.

- 
- Part 2            Products
- 2.1            CONDUITS
- .1          Rigid PVC conduit: to CSA C22.2 No. 211.2.
- 2.2            CONDUIT FASTENINGS
- .1          Two hole straps to secure surface conduits.
- 2.3            CONDUIT FITTINGS
- .1          Fittings: to CAN/CSA C22.2 No. 18, manufactured for use with conduit specified.
- .2          Ensure factory "ells" where 90 degrees bends are required.
- 2.4            CONDUIT CEMENT
- .1          Conduit cement and primer for PVC conduit.
- Part 3           Execution
- 3.1            MANUFACTURER'S INSTRUCTIONS
- .1          Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.
- 3.2            INSTALLATION
- .1          Install conduits to cause minimum interference in spaces through which they pass.
- .2          Use PVC conduit, fittings and straps for all surface and exposed work to services, devices and equipment where indicated. Install in accordance with manufacturer's recommendations.
- .3          Use both primer and conduit cement for joining conduits and fittings.
- .4          Minimum conduit size: 21 mm.
- .5          Use standard radius elbows for PVC conduit.
- .6          Remove and replace blocked conduit sections.
- .1          Do not use liquids to clean out conduits.
- .7          Dry conduits out before installing wire.

---

3.3 SURFACE CONDUITS

- .1 Run parallel or perpendicular to wharf.
- .2 Group conduits wherever possible on channels.

3.4 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 26 05 00 – Common Work Results for Electrical.

1.2 PRODUCT DATA

- .1 Submit product data in accordance with Section 01 33 00 – Submittal Procedures.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements.
- .2 Waste Management and Disposal:
  - .1 Separate waste materials for reuse and recycling.
  - .2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

Part 2 Products

2.1 PHOTOELECTRIC LIGHTING CONTROL

- .1 Photoelectric Lighting Controls: to CSA C22.1.
  - .1 Weather resistant enclosure with 21mm stem for flush mounting in enclosure.
  - .2 Cadmium sulfide conformal coated 16mm diameter sensor
  - .3 Normally closed contacts (fail in ON position).
  - .4 Voltage variation: plus or minus 10%.
  - .5 Temperature range: minus 40 degrees C to plus 40 degrees C.
  - .6 Switching on lights at 10 to 50 lx, OFF at 30 to 150 lx.
  - .7 Two minute time delay ON and OFF.
  - .8 Colour coded leads: 225 mm long.
  - .9 Rated for 2000W at 120V.
  - .10 Acceptable manufacturer or approved equal:
    - .1 Tork #3000.

Part 3            Execution

3.1              INSTALLATION

.1                Install photoelectric controls in accordance with manufacturer's instructions.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 26 05 00 – Common Work Results for Electrical.
- .2 Section 26 05 28 - Grounding - Secondary.
- .3 Section 26 28 23 - Disconnect Switches - Fused and Non-Fused.

1.2 UTILITY CHARGES

- .1 Pay any Utility charges for connecting new services and/or new meter installations.

1.3 SUPPLY DATA

- .1 Power supply: 240V, 60 Hz, single phase, 3 wire grounded neutral.

Part 2 Products

2.1 EQUIPMENT

- .1 Fused disconnect switch: in accordance with Section 26 28 23 - Disconnect Switches - Fused and Non-Fused, rating as indicated.

Part 3 Execution

3.1 INSTALLATION

- .1 Remove existing 200A disconnect switches.
- .2 Install new 100A disconnect switches.
- .3 Connect to incoming service.
- .4 Connect to outgoing loads.
- .5 Make grounding connections in accordance with Section 26 05 28 – Grounding – Secondary and Utility requirements.
- .6 Make arrangement for Utility meter installation. Coordinate with service owner.

END OF SECTION

- 
- Part 1            General
- 1.1            SECTION INCLUDES
- .1            Materials and installation for standard and custom breaker type panelboards.
- 1.2            RELATED SECTIONS
- .1            Section 01 33 00 – Shop Drawings and Other Submittal Procedures.
- .2            Section 26 05 00 – Common Work Results for Electrical.
- .3            Section 26 28 16.02 – Moulded Case Circuit Breakers.
- 1.3            REFERENCES
- .1            Canadian Standards Association (CSA International)
- .1            CSA C22.2No.29-M1989(R2000), Panelboards and enclosed Panelboards.
- 1.4            SHOP DRAWINGS
- .1            Submit shop drawings in accordance with Section 01 33 00 – Shop Drawings and Other Submittal Procedures.
- .2            Drawings to include electrical detail of panel, branch breaker type, quantity, ampacity and enclosure dimension.
- 1.5            DELIVERY, STORAGE AND HANDLING
- .1            Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements.
- .2            Waste Management and Disposal:
- .1            Separate waste materials for reuse and recycling.
- .2            Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- Part 2            Products
- 2.1            PANELBOARDS
- .1            Panelboards: to CSA C22.2No.29 and product of one manufacturer.
- .1            Install circuit breakers in panelboards before shipment.
- .2            In addition to CSA requirements manufacturer's nameplate must show fault current that panel including breakers has been built to withstand.

- 
- .2 250 V panelboards: bus and breakers rated for 10K A (symmetrical) interrupting capacity or as indicated.
  - .3 Sequence phase bussing with odd numbered breakers on left and even on right, with each breaker identified by permanent number identification as to circuit number and phase.
  - .4 Panelboard: main breaker, number of circuits, and number and size of branch circuit breakers as indicated. Suitable for service entrance use.
  - .5 Aluminum bus with neutral of same ampere rating as mains.
  - .6 Mains: suitable for bolt-on breakers.
  - .7 Stainless steel enclosure CSA 4X rated.
  - .8 Gasketed door with locking handle and piano hinge.
  - .9 Four keys for panelboard.
  - .10 Condensate drain in bottom of enclosure.
  - .11 Acceptable manufacturer or approved equal:
    - .1 Siemens.
- 2.2 BREAKERS
- .1 Breakers: to Section 26 28 16.02 – Moulded Case Circuit Breakers.
  - .2 Breakers with thermal and magnetic tripping in panelboards except as indicated otherwise.
- 2.3 EQUIPMENT IDENTIFICATION
- .1 Provide equipment identification in accordance with Section 26 05 00 – Common Work Results for Electrical.
  - .2 Nameplate for each panelboard size 4 engraved as indicated.
  - .3 Complete circuit directory with typewritten legend showing location and load of each circuit.
  - .4 Arc flash hazard label installed on panel door.



Part 3 Execution

3.1 INSTALLATION

- .1 Locate panelboards as indicated and mount securely, plumb, true and square, to adjoining surfaces.
- .2 Mount panelboards to height specified in Section 26 05 00 – Common Work Results for Electrical or as indicated.
- .3 Connect loads to circuits.
- .4 Connect neutral conductors to common neutral bus with respective neutral identified.

END OF SECTION

DESCRIPTION		WATTAGE		# BKR P	CIRCUIT	BKR AMP	# BKR P	WATTAGE		DESCRIPTION	
		A	B					A	B		
POWER SUPPLY: 120/240V, 1Ø, 3W MAINS: 100A MAIN BREAKER NUMBER OF CCTS: 18 MOUNTING: SURFACE LOCATION: PLYWOOD BB BETWEEN 17 & 18 REMARKS: CSA 4 SS ENCLOSURE											
PANEL: 'PRIVATE SERVICE 1'											
(GFI) 15A OUTLET BELOW PANEL		1000		1	1	15	2	50	2000	2000	60A OUTLET BELOW PANEL
30A OUTLET BELOW PANEL		1500		2	3	30	4				
					5		6				
					7		8				
					9		10				
					11		12				
					13		14				
					15		16				
					17		18				
PHASE LOADS:		2500	1500						2000	2000	
TOTAL LOAD:		8000									
TOTAL PHASE LOADS		4500	3500								(GFI) - GROUND FAULT INTERRUPT
CURRENT (A) @ 240V:										33	

DESCRIPTION		WATTAGE		# BKR P	CIRCUIT	BKR AMP	# WATTAGE		DESCRIPTION	
		A	B				A	B		
POWER SUPPLY: 120/240V, 1Ø, 3W MAINS: 100A MAIN BREAKER NUMBER OF CCTS: 18 MOUNTING: SURFACE LOCATION: PLYWOOD BB BETWEEN 17 & 18 REMARKS: CSA 4 SS ENCLOSURE										
<u>PANEL: PRIVATE SERVICE 2</u>										
(GFI) 15A OUTLET BELOW PANEL		1000		1	15	1	2	2000		60A OUTLET BELOW PANEL
30A OUTLET BELOW PANEL		1500		2	30	3	4	2000		
		1500				5	6			
30A OUTLET ON LIGHT POLE 4 FOR LOBSTER CAR		1500		2	30	7	8			
		1500				9	10			
						11	12			
						13	14			
						15	16			
						17	18			
PHASE LOADS:		4000	3000					2000	2000	
TOTAL LOAD:		11000								
TOTAL PHASE LOADS		6000	5000							(GFI) - GROUND FAULT INTERRUPT
CURRENT (A) @ 240V:										46

POWER SUPPLY: 120/240V, 1φ, 3w MAIN BREAKER: 200A NUMBER OF CCTS: 42		PANEL: 'A'										MOUNTING: SURFACE LOCATION: SERVICE ENCLOSURE REMARKS:	
DESCRIPTION	WATTAGE		# BKR		CIRCUIT		BKR		# WATTAGE		DESCRIPTION		
	A	B	P	AMP			AMP	P	A	B			
LIGHTING POLES 1-4 AND GANGWAY	360		1	15	1	a	2	15	1		(GFI) SPARE		
SPARE LIGHTING CIRCUIT			1	15	3	b	4	15	1		(GFI) SPARE		
POLE 1 RECEPTACLE	1440		1	15	5	a	6	15	1		(GFI) SPARE		
POLE 2 RECEPTACLE		1440	1	15	7	b	8	15	1		(GFI) SPARE		
POLE 3 RECEPTACLE	1440		1	15	9	a	10	15	1		(GFI) SPARE		
POLE 4 RECEPTACLE		1440	1	15	11	b	12	15	1		(GFI) SPARE		
SPARE			1	20	13	a	14	15	1		(GFI) SPARE		
SPARE					15	b	16	15	1		(GFI) SPARE		
SPARE					17	a	18	15	1		(GFI) SPARE		
SPARE					19	b	20	15	1		(GFI) SPARE		
SPARE					21	a	22	15	1		(GFI) SPARE		
SPARE					23	b	24	15	1		(GFI) SPARE		
SPARE					25	a	26	15	1		(GFI) SPARE		
SPARE					27	b	28	15	1		(GFI) SPARE		
SPARE					29	a	30	15	1		(GFI) SPARE		
SPARE					31	b	32	15	1		(GFI) SPARE		
SPARE					33	a	34	15	1		(GFI) SPARE		
WELDER	2880		2	30	35	b	36	15	1		(GFI) SPARE		
WINCH #1	2880		2	50	37	a	38	50	2	4800	WINCH #2		
	4800				39	b	40			4800			
	4800				41	a	42	15	1		LIGHTING CONTACTOR		
PHASE LOADS:	10920	10560								4800	4800		
TOTAL LOAD:	31080												
TOTAL PHASE LOADS	15720	15360											
CURRENT (A) @ 240V:	130												

**BOLD NEW TO BE ADDED**  
 (GFI) - GROUND FAULT INTERRUPT  
 (+) - LOCKING BREAKER

- 
- Part 1            General
- 1.1            RELATED SECTIONS
- .1            Section 26 05 00 - Common Work Results for Electrical.
- 1.2            REFERENCES
- .1            Canadian Standards Association (CSA International)
- .1            CSA-C22.2 No.42-99(R2002), General Use Receptacles, Attachment Plugs and Similar Devices.
- .2            CSA-C22.2 No.42.1-00, Cover Plates for Flush-Mounted Wiring Devices (Bi-national standard, with UL 514D).
- .3            CSA-C22.2 No. 55-M1986 (R2012), Special Use Switches.
- 1.3            ACTION AND INFORMATIONAL SUBMITTALS
- .1            Submit shop drawings in accordance with Section 01 33 00 – Shop Drawings and Other Submittal Procedures.
- .2            Shop Drawings to include manufacturer's instructions, printed product literature and data sheets including characteristics, physical size, finish and limitations.
- 1.4            DELIVERY STORAGE AND HANDLING
- .1            Deliver, store and handle materials in accordance with Section 01 61 00– Common Product Requirements.
- .2            Separate and recycle waste materials in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal:
- .1            Separate waste materials for reuse and recycling.
- .2            Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- Part 2            Products
- 2.1            RECEPTACLES
- .1            Duplex receptacles, CSA type 5-15R, 125V, 15A, grounded, to: CSA-C22.2 No.42 with following features:
- .1            Corrosion resistant, marine grade, CSA 4X enclosure complete with weatherproof cover. Mounted in corrosion resistant PVC outlet box suitable for separately mounted devices.
- .2            Suitable for No. 10 AWG back and side wiring.
- .3            Triple wipe contacts and riveted grounding contacts.

- 
- .4 Acceptable materials for outlets:
    - .1 Box: Leviton two gang FDBX2-Y (for 1 duplex and GFI module).
    - .2 Receptacle: Hubbell #HBLS2CM62.
    - .3 Cover: Hubbell #WP826.
  - .2 Single receptacles, CSA type L5-20R, 125V, 20A, grounded, to: CSA-C22.2 No. 42 with following features:
    - .1 Corrosion resistant, marine grade, CSA 4X enclosure complete with weatherproof cover. Mounted in corrosion resistant PVC outlet box suitable for separately mounted devices.
    - .2 Suitable for No. 10 AWG back and side wiring.
    - .3 Triple wipe contacts and riveted grounding contacts.
    - .4 Acceptable materials for outlets:
      - .1 Box: Leviton two gang FDBX2-Y (for 2 receptacles).
      - .2 Receptacle c/w cover: Leviton #97W47-S.
  - .3 Single receptacles, CSA type L14-30R, 125V/250V, 30A, grounded, to: CSA-C22.2 No.42 with following features:
    - .1 Corrosion resistant, marine grade, CSA 4X enclosure complete with weatherproof cover and stainless steel mounting hardware. Mounted in corrosion resistant rigid PVC outlet box.
    - .2 Suitable for No. 10 AWG back and side wiring.
    - .3 Triple wipe contacts and riveted grounding contacts.
    - .4 Acceptable materials:
      - .1 Box: Leviton FDBX1-Y.
      - .2 Receptacle: Leviton #99W74-S.
  - .4 Single welding receptacles, CSA type L6-30R, 250V, 30A, grounded, to: CSA-C22.2 No.42 with following features:
    - .1 Corrosion resistant, marine grade, CSA 4X enclosure complete with weatherproof cover and stainless steel mounting hardware. Mounted in corrosion resistant rigid PVC outlet box.
    - .2 Suitable for No. 10 AWG back and side wiring.
    - .3 Triple wipe contacts and riveted grounding contacts.
    - .4 Acceptable materials:
      - .1 Box: Leviton FDBX1-Y.
      - .2 Receptacle: Leviton #99W48-S.
- 2.2 PRIVATE SERVICES PIN & SLEEVE OUTLETS
- .1 Receptacle rated 60A,125/240V, 3P, 4W pin and sleeve type as indicated.
    - .1 Mechanically interlocked to non fused disconnect switch.
    - .2 Watertight polyester and nylon enclosure.
    - .3 Padlockable switch handle.

- 
- .4 Acceptable materials:
    - .1 Leviton 460MI12.
    - .2 Hubbell HBL460MI12W.
  - .2 Pin and sleeve watertight plug 60A, 3P, 4W to match receptacle. Supply quantity of (2) two plugs for each outlet installed:
    - .1 Impact and corrosion resistant thermoplastic body.
    - .2 Colour coded front housing.
    - .3 Mechanical cord clamp with locking screw.
    - .4 Acceptable materials:
      - .1 Leviton 460P12W.
      - .2 Hubbell HBL460P12W.
- 2.3 GFI MODULE
- .1 GFI Module rated 20A, 120VAC, 60 Hz with the following features:
    - .1 Corrosion resistant, marine grade, CSA 3R enclosure complete with weatherproof cover. Mounted in corrosion resistant PVC outlet box.
    - .2 Suitable for No. 10 AWG back wiring.
    - .3 Acceptable materials for modules:
      - .1 GFI Module: Hubbell #GFM20.
      - .2 Cover: Killark #FCL-GF

Part 3 Execution

3.1 INSTALLATION

.1 Receptacles:

- .1 Install receptacles in tandem device type outlet box when more than one receptacle is required in one location.
- .2 Mount receptacles and outlets at heights indicated.

.2 Private Service Pin and Sleeve outlets:

- .1 Install outlets as indicated.
- .2 Turn plugs over to Private Service owner.

.3 GFI Modules:

- .1 Install GFI modules in two gang tandem outlet box as indicated.

.4 Identification:

- .1 Provide identification indicating circuit and panel number at all wiring devices using lamacoid plates.

END OF SECTION



- 
- Part 1            General
- 1.1            RELATED SECTIONS
- .1            Section 26 05 00 – Common Work Results for Electrical.
- .2            Section 26 56 20.01 – Site Lighting.
- 1.2            ACTION AND INFORMATIONAL SUBMITTALS
- .1            Submit shop drawings in accordance with Section 01 33 00 – Shop Drawings and Other Submittal Procedures.
- .2            Shop Drawings to include manufacturer's instructions, printed product literature and data sheets including characteristics, physical size, finish and limitations.
- 1.3            DELIVERY, STORAGE AND HANDLING
- .1            Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements.
- .2            Separate and recycle waste materials in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
- .1            Separate waste materials for reuse and recycling.
- .2            Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- 1.4            MAINTENANCE MATERIALS
- .1            Three spare fuses of each type and size installed up to and including 100 A.
- Part 2            Products
- 2.1            FUSES - GENERAL
- .1            Fuses: product of one manufacturer.
- 2.2            FUSE TYPES
- .1            Type J2 fast acting or type R3, (UL Class RK1) fast acting Class R.
- .2            Class CC fuses.
- 2.3            FUSE HOLDERS FOR LIGHT POLES
- .1            Suitable for type CC fuses to Section 26 56 20.01 – Site Lighting.

Part 3 Execution

3.1 INSTALLATION

- .1 Install fuses in mounting devices immediately before energizing circuit.
- .2 Ensure correct fuses fitted to physically matched mounting devices.
- .3 Ensure correct fuse is fitted to assigned electrical circuit.
- .4 Install Class CC fuses in inline watertight fuseholder in light poles.

END OF SECTION

- 
- Part 1            General
- 1.1            RELATED SECTIONS
- .1            Section 26 05 00 – Common Work Results for Electrical.
- 1.2            REFERENCES
- .1            Canadian Standards Association (CSA International).
- .1            CSA-C22.2 No. 5-02, Moulded-Case Circuit Breakers, Moulded-Case Switches and Circuit-Breaker Enclosures (Tri-national standard with UL 489, tenth edition, and the second edition of NMX-J-266-ANCE).
- 1.3            ACTION AND INFORMATIONAL SUBMITTALS
- .1            Submit shop drawings in accordance with Section 01 33 00 – Shop Drawings and Other Submittal Procedures.
- .2            Shop Drawings to include manufacturer's instructions, printed product literature and data sheets including characteristics, physical size, finish and limitations.
- 1.4            DELIVERY STORAGE AND HANDLING
- .1            Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements.
- .2            Separate and recycle waste materials in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
- .1            Separate waste materials for reuse and recycling.
- .2            Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- Part 2            Products
- 2.1            BREAKERS GENERAL
- .1            Moulded-case circuit breakers, to CSA C22.2 No. 5.
- .2            Bolt-on moulded case circuit breaker: quick- make, quick-break type, for manual and automatic operation with temperature compensation for 40 degrees C ambient.
- .3            Common-trip breakers: with single handle for multi-pole applications.
- .4            Magnetic instantaneous trip elements in circuit breakers to operate only when value of current reaches setting.
- .5            Circuit breakers to have minimum 10KA symmetrical rms interrupting capacity rating.

- 
- .6 Circuit breakers being installed in panelboards to be by the same manufacturer as the panelboard.
  - .7 Breakers must be new, complete with original factory warranty and supplied from an authorized manufacturer's distributor.
- 2.2 THERMAL MAGNETIC BREAKERS
- .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.
- 2.3 OPTIONAL FEATURES
- .1 Include ground fault interrupting capability (5ma maximum) where indicated.
- Part 3 Execution
- 3.1 INSTALLATION
- .1 Install circuit breakers as indicated.

END OF SECTION

- 
- Part 1            General
- 1.1            RELATED REQUIREMENTS
- .1            Section 26 05 00 – Common Work Results for Electrical.
- .2            Section 26 28 13.01 – Fuses – Low Voltage.
- 1.2            REFERENCES
- .1            Canadian Standards Association (CSA International).
- .1            CSA C22.2 No.4-04 (R2009), Enclosed and Dead-Front Switches (Tri-National Standard with ANCE NMX-J-162-2004 and UL 98).
- .2            CSA C22.2 No.39-M1987 (R2007), Fuseholder Assemblies.
- 1.3            ACTION AND INFORMATIONAL SUBMITTALS
- .1            Submit shop drawings in accordance with Section 01 33 00 – Shop Drawings and Other Submittal Procedures.
- .2            Product data: submit manufacturer's instructions, printed product literature and data sheets including characteristics, physical size, finish and limitations.
- 1.4            WASTE MANAGEMENT AND DISPOSAL
- .1            Separate waste materials for reuse and recycling in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
- Part 2            Products
- 2.1            DISCONNECT SWITCHES TYPE 1
- .1            Heavy duty, fusible, service entrance rated, CSA 1 enclosure or as indicated to CSA C22.2 No.4, size as indicated.
- .2            Provision for padlocking in off switch position by three locks.
- .3            Mechanically interlocked door to prevent opening when handle is in ON position.
- .4            Fuses: size as indicated, in accordance with Section 26 28 13.01 - Fuses - Low Voltage.
- .5            Fuseholders: to CSA C22.2 No.39, relocateable and suitable without adaptors, for type and size of fuse indicated.
- .6            Quick-make, quick-break action.
- .7            ON-OFF switch position indication on switch enclosure cover.

- 
- .8 Acceptable manufacturer or approved equal:
    - .1 Cutler-Hammer.
    - .2 Siemens.
    - .3 Square-D.
  
  - 2.2 DISCONNECT SWITCHES TYPE 2
    - .1 Heavy duty, non-fusible, high impact non-conductive Valox enclosure, IP67 rated. Complete with factory hubs for cable connections.
    - .2 Provision for padlocking in off switch position by three locks.
    - .3 Mechanically interlocked door to prevent opening when handle is in ON position.
    - .4 Quick-make, quick-break action.
    - .5 ON-OFF switch position indication on switch enclosure cover.
    - .6 Acceptable manufacturer or approved equal:
      - .1 Leviton Powerswitch.
  
  - 2.3 EQUIPMENT IDENTIFICATION
    - .1 Provide equipment identification in accordance with Section 26 05 00 - Common Work Results for Electrical.
    - .2 Indicate name of load controlled on size 4 nameplate.
  
  - Part 3 Execution
  
  - 3.1 INSTALLATION
    - .1 Install disconnect switches complete with fuses as indicated.

END OF SECTION

- 
- Part 1            General
- 1.1            RELATED SECTIONS
- .1            Section 26 05 00 - Common Work Results for Electrical.
  - .2            Section 26 28 13.01 – Fuses – Low Voltage.
- 1.2            ACTION AND INFORMATIONAL SUBMITTALS
- .1            Submit shop drawings in accordance with Section 01 33 00 – Shop Drawings and Other Submittal Procedures.
  - .2            Shop Drawings to include manufacturer's instructions, printed product literature and data sheets including characteristics, physical size, finish and limitations.
- 1.3            DELIVERY STORAGE AND HANDLING
- .1            Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements.
  - .2            Separate and recycle waste materials in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
    - .1            Separate waste materials for reuse and recycling.
    - .2            Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- 1.4            WARRANTY
- .1            Luminaires to have a 5-year unlimited warranty on electrical, including LEDs and driver and on luminaire finish.
  - .2            Poles to have a 3 year warranty on structure and finish.
- Part 2            Products
- 2.1            ALUMINUM POLES
- .1            Aluminum poles: to CSA C22.2 No. 206 designed for underground wiring and:
    - .1            Mounting on concrete anchor base without transformer base.
    - .2            Style: round monotube, minimum 6.4 mm thick fabricated from aluminum alloy 6063 per ASTM B221. Finish rotary polish.
    - .3            Access handhole 500 mm above pole base for wiring connections, with welded on reinforcing frame and bolted-on cover.
    - .4            Size: 6095 mm long, tapered from 203 mm to 114 mm.

- .5 Pole base: cast aluminum alloy, one piece construction, joined to shaft with circumferential welds at top and bottom of base.
- .6 Anchor bolts: Existing to be confirmed on site.
- .7 Ground lug.
- .8 762mm dia. tenon for post top fixture.
- .9 Vibration damper
- .10 Acceptable manufacturer:
  - .1 Aluminous Lighting Products.

## 2.2 LUMINAIRES

### .1 Type A.

- .1 Luminaire with die cast aluminum weatherproof housing and:
  - .1 Lamp type: LED, 5,419 initial lumens, @ 350ma, 55 watts, 5700K.
  - .2 Versatile modular light bar.
  - .3 Optical assembly:
    - .1 For LED lamps:
      - .1 Refractor: direct contact type, minimizing light loss and providing control and uniformity.
  - .4 Light Distribution:
    - .1 IES distribution Type 5.
  - .5 Factory wired with optimized 350ma power driver, 120V terminated at terminal block.
  - .6 Less than 20% THD, PF greater than 0.9, integral 10kV surge protection.
  - .7 Thermal management using heat sinks.
  - .8 Bird deterrent metal spikes.
  - .9 762mm dia. tenon for mounting on 6095 mm aluminum pole.
  - .10 Die cast and extruded aluminum housing, fade, abrasion resistant, corrosion resistant, natural finish, suitable for a marine environment. Complete luminaire to be IP 66 rated.
  - .11 Certified to ANSI C136.31 3G bridge and overpass vibration standards.
  - .12 Acceptable materials:
    - .1 GARDCO #SFRP-T3-5M-55LA-4835-CW-120-AR-NP-METAL SPIKES.

### .2 Type B.

- .1 Luminaire with die cast aluminum weatherproof housing and:
  - .1 Lamp type: LED, 14,657 initial lumens, @ 700ma, 139 watts, 5700K.
  - .2 Versatile modular light bar.



- .3 Optical assembly:
  - .1 For LED lamps:
    - .1 Refractor: direct contact type, minimizing light loss and providing control and uniformity.
  - .4 Light Distribution:
    - .1 IES distribution Type 4.
  - .5 Factory wired with optimized 700ma power driver, 120V terminated at terminal block.
  - .6 Less than 20% THD, PF greater than 0.9, integral 10kV surge protection.
  - .7 Thermal management using heat sinks.
  - .8 Bird deterrent metal spikes.
  - .9 Mounted on existing wood pole with retrofit arm mount adaptor.
  - .10 Die cast and extruded aluminum housing, fade, abrasion resistant, corrosion resistant, natural finish, suitable for a marine environment. Light engine to be IP 66 rated.
  - .11 Certified to ANSI C136.31 3G bridge and overpass vibration standards.
  - .12 Acceptable materials:
    - .1 GARDCO #ECF-1-4-135LA-6470-CW-120-NP-RAM- METAL SPIKES
- .3 Type C.
  - .1 Floodlight luminaire with die cast aluminum weatherproof housing and:
    - .1 Lamp type: LED, 13,295 initial lumens, 133 watts, 5000K.
    - .2 Multi –chip high-output long life LED light bar.
    - .3 Optical assembly:
      - .1 For LED lamps:
        - .1 Precision formed specular finished reflector.
        - .2 Thermal shock, heat resistant tempered glass lens.
    - .4 Light Distribution:
      - .1 6H x 6V beam pattern.
    - .5 120V driver.
    - .6 Less than 20% THD, PF greater than 0.9, integral 10kV surge protection.
    - .7 Heavy duty slip fitter to be mounted on existing davit arm.
    - .8 Die cast and extruded aluminum housing, fade and abrasion resistant, corrosion resistant, bronze finish, suitable for a marine environment. Complete luminaire to be IP 66 rated.
    - .9 Acceptable materials:
      - .1 RAB # FXLED-125-SF
- .4 Type D.
  - .1 Floodlight luminaire with die cast aluminum weatherproof housing and:
    - .1 Lamp type: LED, 14,581 initial lumens, 155 watts, 5000K.

- .2 Multi –chip high-output long life LED light bar.
  - .3 Optical assembly:
    - .1 For LED lamps:
      - .1 Precision formed specular finished reflector.
      - .2 Thermal shock, heat resistant tempered glass lens.
  - .4 Light Distribution:
    - .1 6H x 6V beam pattern.
  - .5 120V driver.
  - .6 Less than 20% THD, PF greater than 0.9, integral 10kV surge protection.
  - .7 Heavy duty slip fitter to be mounted on existing davit arm.
  - .8 Die cast and extruded aluminum housing, fade and abrasion resistant, corrosion resistant, bronze finish, suitable for a marine environment. Complete luminaire to be IP 66 rated.
  - .9 Acceptable materials:
    - .1 RAB # FXLED-150-SF
- .5 Type E.
- .1 Floodlight luminaire with die cast aluminum weatherproof housing and:
    - .1 Lamp type: LED, 35,083 initial lumens, 317 watts, 5000K.
    - .2 Multi –chip high-output long life LED light bar.
    - .3 Optical assembly:
      - .1 For LED lamps:
        - .1 Precision formed specular finished reflector.
        - .2 Thermal shock, heat resistant tempered glass lens.
    - .4 Light Distribution:
      - .1 3H x 3V beam pattern.
    - .5 120V driver.
    - .6 Less than 20% THD, PF greater than 0.9, integral 10kV surge protection.
    - .7 Heavy duty slip fitter to be mounted on existing davit arm.
    - .8 Die cast and extruded aluminum housing, fade and abrasion resistant, corrosion resistant, bronze finish, suitable for a marine environment. Complete luminaire to be IP 66 rated.
    - .9 Acceptable materials:
      - .1 RAB # FXLED-300-SF-B33
- .6 Type F.
- .1 LED Bollard luminaire with die cast aluminum weatherproof housing and:
    - .1 Lamp type: LED, 828 initial lumens, 16 watts, 5100K, 90 degree light pattern.

- .2 Clear vandal resistant polycarbonate lens.
- .3 Four anchor bolts with internal leveling screws
- .4 120V driver with less than 20% THD, PF greater than 0.9, integral 4kV surge protection.
- .5 Die cast and extruded aluminum housing, fade and abrasion resistant, corrosion resistant, bronze finish, suitable for a marine environment.
- .6 Acceptable materials:
  - .1 RAB # BLEDR12

2.3 FUSE KIT

- .1 Inline watertight fuseholder c/w 3A class CC midget fuses.
  - .1 Acceptable manufacturer:
    - .1 GEC #CRS30H c/w 3A type C fuse.

Part 3 Execution

3.1 INSTALLATION

- .1 Prior to ordering pole confirm existing base bolt pattern on site.
- .2 Install new poles and pole mounted luminaires and install new luminaires as noted.
- .3 Replace existing flood lights with new and connect to existing circuits. Aim floods at angles indicated.
- .4 Install new bollard lights on floats and connect to existing circuit as noted. Provide a 300mm x 600mm x 5mm stainless steel support plate on underside of float for bollard supports. Bollards to be bolted through decking and plate.
- .5 Secure luminaire to pole tenon by tightening set screws. Install loctite on threads and tighten set screws by alternating from one side of hub to the other until all screws are tightened to manufacturers' torque specifications. Provide report indicating number of screws torqued per luminaire and torque values. Once plumbed and secured, drill through fixture and tenon and install a .95mm stainless steel bolt and locking nut to secure luminaire to pole
- .6 Install SOW cables in poles from hand hole to luminaire support at top of pole using a suitable wire grip.
- .7 Install fuses in fuse clips in poles and bollards.
- .8 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.

END OF SECTION