

# **SPECIFICATION**

**Floating Breakwater Construction, Arnold's Cove, NL**

**DFO File # FP802-150068**

**Prepared for: Fisheries and Oceans Canada**

**Date: June 8, 2015**

DEPARTMENT OF FISHERIES  
SMALL CRAFT HARBOURS  
SPECIFICATION FOR  
FLOATING BREAKWATER CONSTRUCTION  
ARNOLD'S COVE, NEWFOUNDLAND & LABRADOR

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DEPARTMENT OF FISHERIES AND OCEANS  
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<b>DRAWING NUMBER</b>	<b>DRAWING TITLE</b>
C1 of 4	Site Plan
C2 of 4	Floating Breakwater Plan and Views
C3 of 4	Floating Breakwater Plan, Section, and Views
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## **PART 1 - GENERAL**

### **1.1 SCOPE**

- .1 The scope of work for this project is the provision of construction activities to provide a prototype floating breakwater structure, as is more specifically described in the Description of Work and the Drawings and Specifications. The work covered consists of the furnishing of all plant, labour, equipment and material for the construction of a floating breakwater at Arnold's Cove, Newfoundland and Labrador, in strict accordance with specifications and accompanying drawings and subject to all terms and conditions of the Contract. Bidders are advised that opportunities and requirements may arise that may warrant changes to the work that are in keeping with this general scope of work. Such changes will be made through the Change Order processes as outlined in the contract documents.

### **1.2 DESCRIPTION**

- .1 In general, the work under this contract consists of, but will not necessarily be limited to, the following:
  - .1 Construction of a new 9.15 m wide, 9.15 m long treated timber floating breakwater, consisting of galvanized steel gusset plates, HDPE pipe, rubber tires, mooring lines and concrete mooring blocks seated on the harbour bottom, as detailed on the drawings.
  - .2 All timber, fasteners, metal fabrications, and all other miscellaneous materials incorporated into the breakwater construction to be weighed prior to installation, with weights provided to the Departmental Representative.

### **1.3 SITE OF WORK**

- .1 Work will be carried out at Arnold's Cove, Newfoundland and Labrador in the location as shown on the accompanying drawings.

### **1.4 DATUM**

- .1 Datum used for this project is Lowest Normal Tides (L.N.T.) which is assumed to be 4.016 m below BM 4-1973 (CHS brass plaque set in concrete deck), as indicated on the drawings. Confirm with Departmental Representative prior to commencement of work.
- .2 Bidders are advised to consult the Tide Tables issued by Fisheries and Oceans in order to make sure of the tidal conditions affecting work.

**PART 1 - GENERAL  
(CONT'D)**

**1.5 FAMILIARIZATION WITH SITE**

- .1 Before submitting a bid, bidders may visit the site and its surroundings, at their own expense, to review and verify the form, nature and extent of the work, materials necessary for the completion of the works, the means of access to the site, severity, exposure and uncertainty of weather, soil conditions, any accommodations they may require, and in general shall 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 Contractors, bidders or those they invite to site are to review specification Section 01 35 28 - Health and Safety Requirements before visiting site. Take all appropriate safety measures for any visit to site, either before or after acceptance of bid.

**1.6 CODES AND STANDARDS**

- .1 Perform work in accordance with the latest edition of the National Building Code of Canada, FCC Standard 373 - Standard for Piers and Wharves ([http://www.hrsdc.gc.ca/eng/labour/fire\\_protection/policies\\_standards/commissioner/373/page00.shtml](http://www.hrsdc.gc.ca/eng/labour/fire_protection/policies_standards/commissioner/373/page00.shtml)), and any other code of provincial or local application including all amendments up to project bid 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.

**1.7 SETTING OUT WORK**

- .1 Set grades and layout work in detail from control points and grades established by Departmental Representative.
- .2 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated or as directed by Departmental Representative.
- .3 Provide devices needed to layout and construct work.
- .4 Supply such devices as straight edges and templates required to facilitate Departmental Representative's inspection of work.
- .5 Supply stakes and other survey markers required for laying out work.

**PART 1 - GENERAL  
(CONT'D)**

**1.8 COST BREAKDOWN**

- .1 Before submitting first progress claim submit breakdown of Contract price in detail as directed by Departmental Representative and aggregating contract price. Departmental Representative will provide the required forms for application of progress payment.
- .2 Provide cost breakdown in same format as the numerical and subject title system used in this specification and thereafter sub-divided into major work components as directed by Departmental Representative.
- .3 Upon approval by Departmental Representative, cost breakdown will be used as basis for progress payment.
- .4 All work items and costs are to be included in the lump sum arrangement, as noted on the Bid and Acceptance Form.

**1.9 WORK SCHEDULE**

- .1 Submit within seven (7) working 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 systems are preferred but not mandatory.
- .4 Submit schedule updates on a minimum monthly basis and more often, when requested by Departmental Representative, due to frequent changing project conditions. Provide a narrative explanation of necessary changes and schedule revisions at each update.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.9 WORK SCHEDULE**  
**(CONT'D)**

- .5 The schedule, including all updates, shall be to the Departmental Representative's approval. Take necessary measures to complete work within approved time. Do not change schedule without Departmental Representative's approval.
- .6 All work on the project will be completed within the time indicated on the Bid and Acceptance Form.

**1.10 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  
NLGA - National Lumber Grades Authority  
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.

**1.11 SITE OPERATIONS**

- .1 Arrange for sufficient space adjacent to project site for conduct of operations, storage of materials, etc. Exercise care so as not to obstruct or damage public or private property in area. Do not interfere with normal day-to-day operations in progress at site. All arrangements for space and access will be made by Contractor.
- .2 Remove snow and ice, as required, to maintain safe access in a manner that does not damage existing structures or interfere with the operations of others.

**1.12 PROJECT MEETINGS**

- .1 Departmental Representative 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 Departmental Representative.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.12 PROJECT MEETINGS**  
**(CONT'D)**

- .3 Departmental Representative will assume responsibility for recording minutes of meetings and forwarding copies to all parties present at meetings.
- .4 Have a responsible member of firm present at all Project Meetings.

**1.13 PROTECTION**

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

**1.14 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, pedestrian, vehicular traffic, and tenant operations. Contractor is reminded that the wharf area is an active fish processing facility and will be active during construction.
- .2 Before commencing work, establish locations 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 shutdown or closure of active service or facility. This includes disconnection of electrical power and communication services to tenants operational areas. Adhere to approved schedule and provide notice to affected parties.
- .4 Provide temporary services to maintain critical facility systems.
- .5 Provide adequate bridging over trenches which cross walkways or roads to permit normal traffic.
- .6 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.



**PART 1 - GENERAL**  
**(CONT'D)**

**1.14 EXISTING SERVICES**  
**(CONT'D)**

- .7 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.

**1.15 DOCUMENTS REQUIRED**

- .1 Maintain at job site, one (1) 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 Site specific Health and Safety Plan and other safety related documents.
  - .11 Permits and Regulatory Approvals and Requirements.
  - .12 Other documents as stipulated elsewhere in the Contract Documents.

**1.16 PERMITS**

- .1 Obtain and pay for all permits, certificates and licenses as required by Municipal, Provincial, Federal and other 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 submissions and approval documents received for above referenced authorities.
- .5 Submit to Departmental Representative, copy of quarry permit, if applicable, prior to start of quarry operations.

**PART 1 - GENERAL  
(CONT'D)**

**1.16 PERMITS  
(CONT'D)**

- .6 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.
- .7 See Appendices for Regulatory Approvals and Responses already obtained by Canada for this project.

**1.17 CUTTING, FITTING AND PATCHING**

- .1 Execute cutting, fitting and patching required to make work fit properly.
- .2 Do not cut, bore, or sleeve load-bearing members.
- .3 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.

**1.18 EXISTING SUB-SURFACE CONDITIONS**

- .1 Information pertaining to the existing sub-surface conditions may be available by contacting the Departmental Representative.
- .2 Contractors are cautioned that any previous investigations that may be available for review, were intended to provide general site information only. Any interpolation and/or assumption made relative to any previous investigations is the Contractor's responsibility.

**1.19 LOCATION OF EQUIPMENT**

- .1 Locate equipment, to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.19 LOCATION OF EQUIPMENT**  
**(CONT'D)**

- .2 Inform Departmental Representative when impending installation conflicts with other new or existing components. Follow directives for actual location.
- .3 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.

**1.20 FISH HABITAT**

- .1 This work is being conducted in an area where fish habitat may be affected. Perform work to conform with rules and regulations governing fish habitat and in accordance with authorization for work or undertakings affecting fish habitat.
- .2 Contact the Department of Fisheries and Oceans (DFO) detachment at St. John's, NL at least 48 hours in advance of starting any work on site.
- .3 Maintain on site a copy of DFO's Letter of Advice regarding this project, and abide by all stipulations, unless otherwise agreed in writing by Departmental Representative.

**1.21 NOTICE TO SHIPPING/MARINERS**

- .1 Notify the Marine Communications and Traffic Services Centre of Fisheries and Oceans Canada, at (709) 772-2083, 10 days prior to commencement and upon completion of the work in order to allow for the issuances of "Notice 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.

**1.22 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.

**PART 1 - GENERAL  
(CONT'D)**

**1.23 WORKS 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 of the General Contractor and shall be resolved at no extra cost to Canada.

**1.24 CONTRACTOR'S USE OF SITE**

- .1 Construction operations, including storage of materials, for this contract not to interfere with the fishing activity and/or the operations at this harbour facility. Maintain full vehicle and vessel access to adjacent wharves at all times during construction.
- .2 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 the Departmental Representative.
- .3 Contractor will take adequate precautions to protect existing concrete deck and asphalt when operating tracked equipment.
- .4 Exercise care so as not to obstruct or damage public or private property in the area.
- .5 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.

**PART 1 - GENERAL  
(CONT'D)**

**1.25 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 workforce 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 workforce 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.

**1.26 FACILITY SMOKING ENVIRONMENT**

- .1 Comply with smoking restrictions.

**1.27 INTERPRETATION OF DOCUMENTS**

- .1 Supplementary to the General Conditions, the Division 01 sections of the specifications take precedence over technical specification in other divisions of the specifications.

**PART 1 - GENERAL**

**1.1 GENERAL**

- .1 Canada will supply certain materials in the Contract for installation and incorporation into the Work by Others.

**1.2 MATERIAL SUPPLIED**

- .1 Canada will supply and install:  
Navigational Lighting

The material supplied by Canada is not a complete list required to complete the work in accordance with the drawings and specifications.

## **PART 1 - GENERAL**

### **1.1 DESCRIPTION**

- .1 Inspecting and testing by inspecting firms or testing laboratories designated by Departmental Representative.

### **1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE**

- .1 Particular requirements for inspection and testing to be carried out by testing laboratory designated by Departmental Representative are specified under various sections.

### **1.3 APPOINTMENT AND PAYMENT**

- .1 Departmental Representative will appoint and pay for services of testing laboratory except for the following:
  - .1 Inspection and testing required by orders of public authorities.
  - .2 Inspection and testing performed exclusively for Contractor's convenience.
  - .3 Mill tests and certificates of compliance.
  - .4 Tests specified to be carried out by Contractor under the supervision of Departmental Representative.
  - .5 Tests requested by Departmental Representative to confirm material specifications when the applicable manufacturer's documentation or test results are unavailable.
  - .6 Additional tests specified in the following paragraph.
- .2 Where test or inspections by designated testing laboratory reveal work not in accordance with contract requirements, pay costs for additional tests or inspections as required by Departmental Representative to verify acceptability of corrected work.

### **1.4 CONTRACTOR'S RESPONSIBILITIES**

- .1 Provide labour, equipment and facilities to:
  - .1 Provide access to work to be inspected and tested.
  - .2 Facilitate inspections and tests.
  - .3 Make good work disturbed by inspection and test.
  - .4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.

**PART 1 - GENERAL  
(CONT'D)**

**1.4 CONTRACTOR'S RESPONSIBILITIES  
(CONT'D)**

- .2 Notify Departmental Representative sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.
- .3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.
- .4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Departmental Representative.

**PART 2 - PRODUCTS**

Not applicable

**PART 3 - EXECUTION**

Not applicable



**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- .1 Shop drawings and product data.
- .2 Samples.
- .3 Certificates.

**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 are 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 measurements 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 and coordinate.
- .9 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.

**PART 1 - GENERAL  
(CONT'D)**

**1.2 SUBMITTAL GENERAL REQUIREMENTS  
(CONT'D)**

- .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 of 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 four (4) copies which will be retained by 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 has been coordinated, regardless of section or trade from which the 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.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.3 SHOP DRAWINGS AND PRODUCT DATA**  
**(CONT'D)**

- .3 (cont'd)
  - .2 (cont'd)
    - .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.
    - .3 Supplement manufacturer's standard drawings and literature with additional information to provide details applicable to project.
    - .4 Delete information not applicable to project on all submittals.
- .4 Allow ten (10) calendar days for Departmental Representative's review of each submission.
- .5 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.
- .6 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.
- .7 Accompany each submission with transmittal letter, 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.
- .8 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.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.3 SHOP DRAWINGS AND PRODUCT DATA**  
**(CONT'D)**

- .8 (cont'd)
- .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.
  - .9 After Departmental Representative's review, distribute copies.
  - .10 The review of shop drawings by the Departmental Representative or their delegated representative is for sole purpose of ascertaining conformance with general concept. This review shall not mean that The Department of Fisheries and Oceans 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.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.4 SCHEDULES, PERMITS AND CERTIFICATES**  
**(CONT'D)**

- .2 Submit copy of permits, notices, compliance Certificates received from 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.

## **PART 1 - GENERAL**

### **1.1 DESCRIPTION**

- .1 Fire Safety Requirements.
- .2 Hot Work Permit.

### **1.2 RELATED WORK**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 35 25 - Special Procedures on Lockout Requirements.
- .3 Section 01 35 28 - 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 for Construction Operations ([http://www.hrsdc.gc.ca/eng/labour/fire\\_protection/policies\\_standards/commissioner/301/page00.shtml](http://www.hrsdc.gc.ca/eng/labour/fire_protection/policies_standards/commissioner/301/page00.shtml)).
  - .2 FCC No. 302-June 1982 Standard for Welding and Cutting ([http://www.hrsdc.gc.ca/eng/labour/fire\\_protection/policies\\_standards/commissioner/302/page00.shtml](http://www.hrsdc.gc.ca/eng/labour/fire_protection/policies_standards/commissioner/302/page00.shtml)).
  - .3 FCC standards, may also be viewed at the Regional Fire Protection Services' 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.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.5 SUBMITTALS**  
**(CONT'D)**

- .2 Submit in accordance with the Submittal General Requirements specified in Section 01 33 00 – Submittal Procedures.

**1.6 FIRE SAFETY REQUIREMENTS**

- .1 Implement and follow fire safety measures during work. Comply with following:
  - .1 National Fire Code, latest edition
  - .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 28.
- .2 In event of conflict between any provisions of above 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 (1) written "Authorization to Proceed" covering the entire project for duration of work; or
  - .2 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.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.7 HOT WORK AUTHORIZATION**  
**(CONT'D)**

- .4 Requirement for individual authorization based on:
  - .1 Nature or phasing of 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 on premises.
- .5 Do not perform any Hot Work until receipt of Departmental Representative's written "Authorization to Proceed" for that portion of work.
- .6 In tenant occupied facility, coordinate performance of Hot Work with Facility Manager through the Departmental Representative. When directed perform Hot Work only during non-operative hours of Facility. Follow Departmental Representative's directives in this regard.

**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 28 – Health & Safety Requirements.
  - .2 Use of a 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 Superintendent, or other authorized person designated by Contractor, granting permission to worker or sub-contractor to proceed with hot 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 28 - Health & Safety Requirements .
- .3 Generic procedures, if 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.



**PART 1 - GENERAL**  
**(CONT'D)**

**1.8 HOT WORK PROCEDURES**  
**(CONT'D)**

- .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 Sub-contractors and Contractor.
- .5 Brief all workers and sub-contractors 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 Departmental Representative's discretion with possible disciplinary measures imposed as specified in Section 01 35 28 - Health & Safety Requirements.

**1.9 HOT WORK PERMIT**

- .1 Hot Work Permit to include, as a minimum, the following data:
  - .1 Project name and project number;
  - .2 Building name, address and specific floor, room or area where hot work will be performed;
  - .3 Date when permit issued;
  - .4 Description of hot work to be performed;
  - .5 Special precautions required, including type of fire extinguisher needed;
  - .6 Name and signature of person authorized issue the permit;
  - .7 Name of worker(s) (clearly printed) to whom the permit is being issued;
  - .8 Time duration that permit is valid (not to exceed 8 hours). Indicate "Start" time & date and "Completion" time & date;
  - .9 Worker signature with date and time upon hot work termination;
  - .10 Specified period of time requiring Safety Watch;
  - .11 Name and signature of person designated as Fire Safety Watcher, complete with time and date when safety watch terminated, certifying that the surrounding area was under continual surveillance and inspection during the full time period specified in permit and commenced immediately upon the completion of Hot Work.
- .2 Permit to be in typewritten form. Industry Standard forms shall only be used if all data specified above is included on form.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.9 HOT WORK PERMIT**  
**(CONT'D)**

- .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(s) upon completion of Hot Work;
  - .3 Fire Safety Watcher upon termination of safety watch and;
  - .4 Returned to Contractor's Site Superintendent 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.

## **PART 1 - GENERAL**

### **1.1 DESCRIPTION**

- .1 Procedures to isolate and lockout electrical facility or other equipment from energy source.

### **1.2 RELATED WORK**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 35 24 - Special Procedures on Fire Safety Requirements.
- .3 Section 01 35 28 - Health and Safety Requirements.

### **1.3 REFERENCES**

- .1 CSA C22.1-06 - Canadian Electrical Code, Part 1, Safety Standard for Electrical Installations.
- .2 CAN/CSA C22.3 No. 1-06 - Overhead Systems.
- .3 CAN/CSA C22.3 No. 7-06 - Underground Systems.
- .4 OHS, Canada Occupational Health and Safety Regulations made under Part II of the Canada Labour Code.

### **1.4 DEFINITIONS**

- .1 Electrical Facility: means any system, equipment, device, apparatus, wiring, conductor, assembly or part thereof that is used for the generation, transformation, transmission, distribution, storage, control, measurement or utilization of electrical energy, and that has an amperage and voltage that is dangerous to persons.
- .2 Guarantee of Isolation: means a guarantee by a competent person in control or in charge that a particular facility or equipment is isolated.
- .3 De-energize: in the electrical sense, that a piece of equipment is isolated and grounded, e.g. if the equipment is not grounded, it cannot be considered de-energized (DEAD).
- .4 Guarded: means that a piece of equipment or facility is covered, shielded, fenced, enclosed, inaccessible by location, or otherwise protected in a manner that, to the extent that is reasonably practicable, will prevent or reduce danger to any person who might touch or go near such item.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.4 DEFINITIONS**  
**(CONT'D)**

- .5 Isolate: means that an electrical facility, a piece of mechanical equipment or machinery is separated or disconnected from every source of electrical, mechanical, hydraulic, pneumatic or other kind of energy that is capable of making it dangerous.
- .6 Live/alive: means that an electrical facility produces, contains, stores or is electrically connected to a source of alternating or direct current of an amperage and voltage that is dangerous or contains any hydraulic, pneumatic or other kind of energy that is capable of making the facility dangerous to persons.

**1.5 COMPLIANCE REQUIREMENTS**

- .1 Perform lockouts in compliance with:
  - .1 Canadian Electrical Code.
  - .2 Federal and Provincial Occupational Health and Safety Acts and Regulations as specified in Section 01 35 28 – Health & Safety Requirements.
  - .3 Regulations and code of practice as applicable to mechanical equipment or other machinery being de-energized.
  - .4 Procedures specified herein.
- .2 In event of conflict between any provisions of above 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.

**1.6 SUBMITTALS**

- .1 Submit copy of proposed Lockout Procedures and sample form of lockout permit for review.
- .2 Submit documentation within seven (7) calendar days of acceptance of bid. Do not proceed with work until submittal has been reviewed by Departmental Representative.
- .3 Submit above documents in accordance with the submittal requirements specified in Section 01 33 00 – Submittal Procedures.
- .4 Resubmit Lockout Procedures with noted revisions as may result from Departmental Representative's review.

**PART 1 - GENERAL  
(CONT'D)**

**1.7 ISOLATION OF EXISTING SERVICES**

- .1 Obtain Departmental Representative's written authorization prior to conducting work on an existing active, energized service or facility required as part of the work and before proceeding with lockout of such services or facility.
- .2 To obtain authorization, submit to Departmental Representative following documentation:
  - .1 Written Request for Isolation of the service or facility and;
  - .2 Copy of Contractor's Lockout Procedures.
- .3 Make a Request for Isolation for each event, unless directed otherwise by Departmental Representative, and as follows:
  - .1 Fill-out standard forms in current use at the facility when so directed by Departmental Representative or;
  - .2 Where no form exists at facility, make request in writing identifying:
    - .1 Identification of system or equipment to be isolated, including its location;
    - .2 Time duration, indicating start time and date and completion time and date when isolation will be in effect.
    - .3 Voltage of service feed to system or equipment being isolated.
    - .4 Name of person making the request.
  - .3 Document to be in typewritten format.
- .4 Do not proceed until receipt of written notification from Departmental Representative granting the isolation request and authorization to proceed with the isolation of designated equipment or facility. Departmental Representative may designate other individual at the facility as the person authorized to grant the isolation request.
- .5 Conduct safe, orderly shut down of equipment or facilities, de-energize and isolate power and other sources of energy and lockout items in accordance with requirement of clause 1.8 below.
- .6 Plan and schedule shut down of existing services in consultation with the Departmental Representative and the Facility Manager. Minimize impact and downtime of facility operations.
- .7 Determine in advance, as much as possible, in cooperation with the Departmental Representative, the type and frequency of situations which will require a Request for Isolation. Follow Departmental Representative's directives in this regard.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.7 ISOLATION OF EXISTING SERVICES**  
**(CONT'D)**

- .8 Conduct hazard assessment as part of the planning process of isolating existing equipment and facilities. Hazard assessments to conform with requirements of Health and Safety Requirements Section 01 35 28 – Health & Safety Requirements.

**1.8 LOCKOUTS**

- .1 Isolate and lockout electrical facilities, mechanical equipment and machinery from all potential energy sources prior to starting work on such items.
- .2 Develop and implement lockout procedures to be followed on site as an integral part of the work.
- .3 Use energy isolation lockout devices specifically designed and appropriate for type of facility or equipment being locked out.
- .4 Use industry standard lockout tags.
- .5 Provide appropriate safety grounding and guards as required.
- .6 Prepare Lockout Procedures in writing. Describe safe work practices, work functions and sequence of activities to be followed on site to safely isolate all potential energy sources and lockout/tagout facilities and equipment.
- .7 Include within procedures a system of worker request and issuance of individual lockout permit by a person, employed by Contractor, designated to be "in-charge" and being responsible for:
  - .1 Controlling issuance of permits or tags to workers.
  - .2 Determining permit duration.
  - .3 Maintaining record of permits and tags issued.
  - .4 Submitting a Request for Isolation to Departmental Representative when required in accordance with Clause 1.7 above.
  - .5 Designating a Safety Watcher, when one is required based on type of work.
  - .6 Ensuring equipment or facility has been properly isolated, providing a Guarantee of Isolation to worker(s) prior to proceeding with work.
  - .7 Collecting and safekeeping lockout tags, returned by workers, as a record of the event.
- .8 Clearly establish, describe and allocate, within procedures, the responsibilities of:
  - .1 Workers.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.8 LOCKOUTS**  
**(CONT'D)**

- .8 (cont'd)
  - .2 Designated person controlling issuance of lockout tags/permits.
  - .3 Safety Watcher.
  - .4 Subcontractors and General Contractor.
- .9 Procedures shall meet the requirements of Codes and Regulations specified in clause 1.5 above.
- .10 Generic procedures, if used, must be edited, supplemented with pertinent information and tailored to reflect specific project conditions. Clearly label as being the procedures applicable to this contract.
  - .1 Incorporate site specific rules and procedures established by Facility Manager and in force at site. Obtain such procedures through Departmental Representative.
- .11 Procedures to be in typewritten format.
- .12 Submit copy of Lockout Procedures to Departmental Representative, in accordance with submittal requirements of clause 1.6 herein, prior to commencement of work.

**1.9 CONFORMANCE**

- .1 Ensure that lockout procedures, as established for project on site, are stringently followed. Enforce use and compliance by all workers.
- .2 Brief all persons working on electrical facilities, mechanical and other equipment fed by an energy source on requirements of this section.
- .3 Failure to perform lockouts in accordance with regulatory requirements or follow procedures specified herein may result in the issuance of a Non-Compliance Notification at Departmental Representative's discretion with possible disciplinary measures imposed as specified in Section 01 35 28 – Health & Safety Requirements.

**1.10 DOCUMENTS ON SITE**

- .1 Post Lockout Procedures on site in common location for viewing by workers.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.10 DOCUMENTS ON SITE**  
**(CONT'D)**

- .2 Keep copies of Request for Isolation submitted to Departmental Representative and lockout permits or tags issued to workers during the course of work for full project duration.
- .3 Upon request, make such data available to Departmental Representative or to authorized safety representative for inspection.



## **PART 1 - GENERAL**

### **1.1 RELATED WORK**

- .1 Section 01 10 10 – General Instructions.
- .2 Section 01 33 00 - Submittal Procedures.
- .3 Section 01 35 24 - Special Procedures on Fire Safety Requirements.
- .4 Section 01 35 25 - Special Procedures on Lockout Requirements.
- .5 Section 01 56 00 – Temporary Barriers and Enclosures.

### **1.2 SUBMITTALS**

- .1 Submit to Departmental Representative copies of the following documents, including updates:
  - .1 Site Specific Health and Safety Plan.
  - .2 Building Permit, compliance certificates and other permits obtained.
  - .3 Reports or directions issued by Federal and Provincial inspectors or other Authority having jurisdiction.
  - .4 Accident or Incident Reports.
  - .5 MSDS data sheets.
  - .6 Name of Contractor's Representative(s) designated to perform full time health and safety supervision on site.
  - .7 Letter of Good Standing/Certificate of Clearance from the Provincial Worker's Compensation Board.
- .2 Medical Surveillance: Obtain and maintain worker medical surveillance documentation for work posing a potential health hazard to workers as stipulated in Federal or Provincial Occupational Health and Safety Regulations. Upon request, submit copy of documentation to Departmental Representative.
- .3 Upon request by Departmental Representative, submit reports and other documentation as stipulated to be produced and maintained by Federal and Provincial Occupational Health and Safety Regulations and as specified herein.
- .4 Submit above documents in accordance with the submittal procedures specified in Section 01 33 00 – Submittal Procedures.

**PART 1 - GENERAL  
(CONT'D)**

**1.3 COMPLIANCE REQUIREMENTS**

- .1 Comply with the Occupational Health and Safety Act for the Province of Newfoundland and Labrador, and the Occupational Health & Safety Regulations made pursuant to the Act.
- .2 Comply with Canada Labour Code Part II, and the Canada Occupational Safety and Health Regulations made under Part II of the Canada Labour Code.
- .3 Observe and enforce construction safety measures required by:
  - .1 National Building Code of Canada, latest edition, Part 8;
  - .2 Provincial Worker's Compensation Board;
  - .3 Municipal statutes and ordinances.
- .4 In event of conflict between any provisions of above 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.
- .5 A copy of the Canada Labour Code Part II may be obtained by contacting:  
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
- .6 Maintain Workers Compensation Coverage for duration of Contract. Submit a current letter of Good Standing to Departmental Representative when submitting site specific Health and Safety Plan and with each Request for Progress Payment.

**1.4 RESPONSIBILITY**

- .1 Be responsible for health and safety of persons on site, of property and for protection of persons circulating adjacent to work operations to extent that they may be affected by conduct of the Work.
- .2 Enforce compliance by all workers, subcontractors and other persons granted access to work site with safety requirements of Contract Documents, applicable federal, provincial, and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.5 SITE CONTROL AND ACCESS**

- .1 Control work site and entry points to construction areas.
  - .1 Delineate and isolate construction areas from other areas of site by use of appropriate means.
  - .2 Post notices and signage at entry points and at other strategic locations identifying that entrance onto site to be restricted to authorized persons only.
  - .3 Signage must be professionally made bilingual (in both official languages) or display internationally understood graphic symbols.
- .2 Approve and grant access to site only to workers and authorized persons.
  - .1 Immediately stop non-authorized persons from circulating in construction areas and remove from site.
  - .2 Provide site safety orientation to all persons before granting access. Advise of site conditions, hazards and mandatory safety rules to be observed on site.
- .3 Secure site at night time to extent required to protect against unauthorized entry. Provide security guard where protection cannot be achieved by other means.
- .4 Ensure persons granted access to site wear appropriate personal protective equipment (PPE) suitable to work and site conditions.
  - .1 Provide such PPE to authorized persons who require access to perform inspections or other approved purposes.

**1.6 PROTECTION**

- .1 Carry out work placing emphasis on health and safety of public, facility personnel, construction workers and protection of the environment.
- .2 Erect safety barricades, lights and signage on site to effectively delineate work areas, protect pedestrian and vehicular traffic around and adjacent to work, and to create a safe working environment.
  - .1 Erect fences, hoarding, protective barriers and temporary lighting as required. See Section 01 56 00 – Temporary Barriers and Enclosures, for minimum acceptable barricades.
- .3 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.

**PART 1 - GENERAL  
(CONT'D)**

**1.7 PERMITS**

- .1 Obtain building permit licenses, compliance certificates and other permits as specified in Section 01 10 10 – General Instructions before and during progress of work. Post on site.
- .2 Where particular permit or compliance certificate cannot be obtained at the required stage of work, notify Departmental Representative in writing and obtain Departmental Representative's approval to proceed prior to carrying out that portion of work.

**1.8 HAZARD ASSESSMENTS**

- .1 Conduct site specific health and safety hazard assessment before commencing project and during course of work identifying risks and hazards resulting from site conditions, weather conditions and work operations.
  - .1 Perform on-going assessments addressing new risks and hazards as work progresses (including when new subtrade or sub-contractor arrives on site).
  - .2 Also, conduct assessment when the scope of work has been changed by Change Order and when potential hazard or weakness in current health and safety practices are identified by Departmental Representative or by an authorized safety representative.
- .2 Record results in writing and address in Health and Safety Plan.
- .3 Keep copy of all assessments on site.

**1.9. PROJECT/SITE CONDITIONS**

- .1 The following are known or potential project related safety hazards at site:
  - .1 Working in close proximity of water.
  - .2 Use of water crafts and floating platforms.
  - .3 Wet and slippery conditions.
  - .4 Inclement weather.
  - .5 Potential structural weaknesses of existing structures.
  - .6 Heavy equipment activity in the area.
  - .7 Heavy lifting.
  - .8 Working from heights.
  - .9 Cutting tools and other construction/power tools.
  - .10 Overhead power/utility lines.
  - .11 Risk of electric shock.
  - .12 Vehicular/pedestrian traffic.
  - .13 Confined Spaces.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.9. PROJECT/SITE CONDITIONS**  
**(CONT'D)**

- .2 Above lists shall not be construed as being complete and inclusive of potential health and safety hazards encountered during work. Include above items into hazard assessment process.
- .3 Obtain from Departmental Representative, copy of MSDS Data sheets for existing hazardous products stored on site or being used by Facility personnel.

**1.10 HEALTH AND SAFETY MEETINGS**

- .1 Attend pre-construction health and safety meeting conducted by Departmental Representative. Have Contractor's Site Superintendent and Contractor's designated health and safety site supervisor in attendance. Departmental Representative will advise of date, time and location.
- .2 Conduct health and safety meetings and tool box briefings on site. Hold on a regular and pre-scheduled basis during entire work in accordance with requirements and frequency as stipulated in provincial Occupational Health and Safety Regulations.
  - .1 Keep workers informed of potential hazards and provide safe work practices and procedures to be followed.
  - .2 Take written minutes and post on site.
- .3 Conduct formal meetings on a minimum monthly basis.

**1.11 HEALTH AND SAFETY PLAN**

- .1 Develop written site-specific Project Health and Safety Plan, based on hazard assessments, prior to commencement of work.
  - .1 Submit copy to Departmental Representative within seven (7) calendar days of acceptance of bid.
  - .2 Submit updates as work progresses.
- .2 Health and Safety Plan shall contain three (3) parts with following information:
  - .1 Part 1 - Hazards: List of individual health risks and safety hazards identified by hazard assessment process.
  - .2 Part 2 - Safety Measures: Engineering controls, personal protective equipment and safe work practices used to mitigate hazards and risks listed in Part 1 of Plan.

**PART 1 - GENERAL  
(CONT'D)**

**1.11 HEALTH AND SAFETY PLAN  
(CONT'D)**

- .2 (cont'd)
- .3 Part 3a: Emergency Response - Standard operating procedures, evacuation measures and emergency response in the occurrence of an accident, incident or emergency.
- .1 Include response to all hazards listed in Part 1 of Plan.
- .2 Evacuation measures to complement the Facility's existing Emergency Response and Evacuation Plan. Obtain pertinent information from Departmental Representative.
- .3 List names and telephone numbers of officials to contact including:
- .1 General Contractor and all sub-contractors.
- .2 Federal and Provincial Departments as stipulated by laws and regulations of authorities having jurisdiction and local emergency resource organizations, as needed based on nature of emergency.
- .3 Officials from DFO and site Facility Management. Departmental Representative will provide list.
- .4 Part 3b: Site Communications:
- .1 Procedures used on site to share work related safety issues between workers, subcontractors, and General Contractor.
- .2 List of critical tasks and work activities, to be communicated with the Facility Manager, which has risk of affecting tenant operations, or endangering health and safety of Facility personnel and the general public. Develop list in consultation with the Departmental Representative.
- .3 Prepare Health and Safety Plan in a three column format, addressing the three parts specified above, as follows:

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Column 1	Column 2	Column 3
Part 1 Identified Hazard	Part 2 Safety Measures	Part 3a/3b Emergency Response & Site Communications

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- .4 Develop Plan in collaboration with subcontractors. Address work activities of all trades. Revise and update Plan as sub-contractors arrive on site.
- .5 Implement and enforce compliance with requirements of plan for full duration of work to final completion and demobilization from site.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.11 HEALTH AND SAFETY PLAN**  
**(CONT'D)**

- .6 As work progresses, review and update Plan. Address additional health risks and safety hazards identified by on-going hazard assessments.
- .7 Post copy of Plan and updates, on site.
- .8 Submission of the Health and Safety Plan and updates, to the Departmental Representative, is for review and information purposes only. Departmental Representative's receipt, review and any comments made of the Plan shall not be construed to imply approval in part, or in whole, of such Plan by Departmental Representative, and shall not be interpreted as a warranty of being complete and accurate, or as a confirmation that all health and safety requirements of the Work have been addressed, and that it is legislative compliant. Furthermore, Departmental Representative's review of the Plan shall not relieve the Contractor of any of his legal obligations for Occupational Health and Safety provisions specified as part of the Work and those required by provincial legislation or those which would otherwise be applicable to the site of the work.

**1.12 SAFETY SUPERVISION AND INSPECTIONS**

- .1 Designate one (1) person to be present on site at all times, responsible for supervising health and safety of the work.
  - .1 Person to be competent in Occupational Health and Construction Safety as defined in the Provincial Occupational Health and Safety Act.
- .2 Assign responsibility, obligation and authority to such designated person(s) to stop work as deemed necessary for reasons of health and safety.
- .3 Conduct regularly scheduled informal safety inspections of work site on a minimum bi-weekly basis.
  - .1 Note deficiencies and remedial action taken in a log book or diary.
- .4 Conduct Formal Inspections on a minimum monthly basis.
  - .1 Use standardized safety checklist forms.
  - .2 Prepare written report for each inspection. Document deficiencies, remedial action needed and assign responsibility for rectification to appropriate subcontractor or worker.
  - .3 Distribute monthly reports to subcontractors for their pursuance.
  - .4 Follow-up and ensure appropriate action and corrective measures are taken.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.12 SAFETY SUPERVISION AND INSPECTIONS**  
**(CONT'D)**

- .5 Cooperate with site's Health and Safety Site Coordinator responsible for the entire site, should one be designated by Departmental Representative.
- .6 Keep inspection reports on site.

**1.13 TRAINING**

- .1 Ensure that all workers and other persons granted access to site are competently trained and knowledgeable on:
  - .1 Safe use of tools and equipment.
  - .2 How to wear and use personal protective equipment (PPE).
  - .3 Safe work practices and procedures to be followed in carrying out work.
  - .4 Site Conditions and minimum safety rules to be observed on site as given in site orientation session.
- .2 Maintain evidence and records of worker training.

**1.14 MINIMUM SITE SAFETY RULES**

- .1 Notwithstanding the requirement to abide by federal and provincial health and safety regulations, the following safety rules shall be considered minimum requirements to be obeyed by all persons granted access:
  - .1 Wear personal protective equipment (PPE) appropriate to function and task on site; the minimum requirements being hard hat, safety footwear and eye protection and for work on or near water, a personal flotation device.
  - .2 Immediately report unsafe activity or condition at site, near-miss accident, injury and damage.
  - .3 Maintain site in tidy condition.
  - .4 Obey warning signs and safety tags.
- .2 Brief workers on site safety rules, and on the disciplinary measures to be taken by Departmental Representative for violation or non-compliance of such rules. Post rules on site.
- .3 The following actions or conduct by Contractor, workers and sub-contractors will be considered as non conformance with the health and safety requirements of the contract for which a Non-Compliance Notification will be issued to the General Contractor by the Departmental Representative:



**PART 1 - GENERAL**  
**(CONT'D)**

**1.14 MINIMUM SITE SAFETY RULES**  
**(CONT'D)**

- .3 (cont'd)
- .1 Failure to follow the minimum site safety rules specified above.
  - .2 Negligence resulting in serious injury or major property damage.
  - .3 Deliberate non-compliance with Federal and Provincial Acts and Regulations.
  - .4 Falsification of information in Workers Compensation Reports, safety reports and other health and safety related documents submitted to Departmental Representative or to Authority having jurisdiction.
  - .5 Possession of firearms on site.
  - .6 Possession of non-prescriptive illegal drugs or alcohol.
  - .7 Action, or lack thereof, resulting in the issuance of Warnings, Fines or Stop Work Orders from a Provincial Authority having jurisdiction.
  - .8 Violation of other specified health and safety rules and requirements as determined by Departmental Representative.
- .4 See elsewhere in this section for details on Non-Compliance Notifications and resulting disciplinary measures.

**1.15 ACCIDENT REPORTING**

- .1 Investigate and report the following incidents and accidents:
- .1 Those as required by Provincial Occupational Health and Safety Act and Regulations.
  - .2 Injury requiring medical aid as defined in the Canadian Dictionary of Safety Terms-1987, published by the Canadian Society of Safety Engineers (C.S.S.E) as follows:
    - .1 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.
    - .3 Property damage in excess of \$5,000.00.
    - .4 Interruption to Facility operations with potential loss to a Federal Department in excess of \$5,000.00.
    - .5 Those which require notification to Workers Compensation Board or other regulatory agencies as stipulated by applicable law or regulations.
- .2 Send written report to Departmental Representative for all above cases.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.16 TOOLS AND EQUIPMENT SAFETY**

- .1 Routinely check and maintain tools, equipment and machinery for safe operation.
- .2 Conduct checks as part of site safety inspections. When requested, submit proof that checks and maintenance have been carried out.
- .3 Tag and immediately remove from site items found faulty or defective.

**1.17 HAZARDOUS PRODUCTS**

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS).
- .2 Keep MSDS data sheets for all products delivered to site. Post on site. Submit copy to Departmental Representative upon receipt.

**1.18 BLASTING**

- .1 Blasting or other use of explosives is not permitted without prior written instructions from Departmental Representative.
- .2 Do blasting operations in accordance with local and provincial codes.

**1.19 POWDER ACTUATED DEVICES**

- .1 Use powder actuated fastening devices only after receipt of written permission from Departmental Representative.

**1.20 CONFINED SPACES**

- .1 Carry out work in confined spaces in compliance with:
  - .1 Provincial Occupational Health and Safety Regulations; and
  - .2 Canada Occupational Safety and Health Regulations (COSH) made under the Canada Labour Code - Part II.
- .2 Conduct hazard assessment and address in Safety Plan before entering confined space.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.20 CONFINED SPACES**  
**(CONT'D)**

- .3 Provide and maintain equipment and PPE as required for the safety and emergency evacuation of persons entering confined spaces.
- .4 Provide training to persons who will be entering and to those persons who will be assisting in the confined space entry process. Training to be specialized instructions beyond basic confined space entry information as required to suit type and conditions of confined space.
- .5 Safety for Inspectors:
  - .1 Upon request, provide PPE and training to Departmental Representative and to other authorized persons, for the purpose of entering confined space to conduct inspections.
  - .2 Be responsible for the efficacy of the equipment and safety of such persons during their entry and occupancy in the confined space.

**1.21 POSTING OF DOCUMENTS**

- .1 Post on site safety documentation as stipulated by Authorities having jurisdiction and as specified herein. Place in a common visible location.

**1.22 SITE RECORDS**

- .1 Maintain on site a copy of all health and safety documentation and reports specified to be produced as part of the work and received from authorities having jurisdiction.
- .2 Upon request, make available to Departmental Representative, or authorized safety representative, for review. Provide copy when directed by Departmental Representative.

**1.23 NON COMPLIANCE AND DISCIPLINARY MEASURES**

- .1 Immediately address and correct health and safety violations and non-compliance issues.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.23 NON COMPLIANCE AND DISCIPLINARY MEASURES**  
**(CONT'D)**

- .2 Negligence or failure to follow occupational health and safety provisions specified in the Contract Documents and those of applicable laws and regulations could result in disciplinary measures taken by the Departmental Representative against the General Contractor.
- .3 DFO uses a system of Non-Compliance Notifications and Disciplinary Measures on projects as follows:
  - .1 A non-compliance notification is issued to the General Contractor, by the Departmental Representative, whenever there is a violation or non-compliance of the project's health and safety requirements and of those of Provincial and Federal regulations by any worker, sub-contractor or other person to whom the Contractor has granted access to the work site.
  - .2 Non-compliance notifications are progressive in nature resulting in disciplinary measures imposed depending on the frequency, nature and severity of the infraction.
  - .3 Disciplinary measures could include:
    - .1 Removal of the offending person or party from site;
    - .2 Financial penalties in the form of progress payment reduction or holdback assessments made against the Contract; and
    - .3 Taking the Work Out of Contractor's Hands in accordance with the General Conditions.
- .4 Departmental Representative will make final decision as to what constitutes a violation and when to issue a Non-compliance Notification.
- .5 Non-compliance Notifications issued by Departmental Representative shall not be construed as to overrule or disregard warnings, orders and fines levied against Contractor by a regulatory agency having jurisdiction.
- .6 Each non-compliance notification issued is given a numerical rating based on a three (3) level numbering system. Each level is progressive in nature to reflect:
  - .1 The seriousness of the infraction as viewed by the Departmental Representative.
  - .2 The degree of disciplinary action which will be taken by the Departmental Representative.
- .7 Numerical ratings are as follows:
  - .1 Non-compliance Notification-Level No. 1 Rating:
    - .1 Situation: occurrence of a first time infraction by a person or party on site.

**PART 1 - GENERAL  
(CONT'D)**

**1.23 NON COMPLIANCE AND DISCIPLINARY MEASURES  
(CONT'D)**

- .7 (cont'd)
  - .1 (cont'd)
    - .2 Action: verbal warning to General Contractor, documented in Departmental files and copy sent to the General Contractor.
  - .2 Non-compliance Notification-Level No. 2 Rating:
    - .1 Situation:
      - .1 The second occurrence of a previous infraction by the same person or party on site; or
      - .2 Accumulation of several level-1 notifications for different infractions by the same person or party on site; or
      - .3 Non-action on the part of the Contractor or subcontractor to rectify non-compliance infractions previously identified in one or several level-1 notifications; or
      - .4 Violation or non-observance of a Federal or Provincial Safety Law or Regulation by sub-contractor or Contractor; or
      - .5 Negligence by a person or party resulting in injury or major property damage.
    - .2 Action: written notice to General Contractor complete with an order for immediate remedial action to be taken. Depending on the severity of the offense, the order may include request for the immediate removal of the offending person or party from site.
  - .3 Non-compliance Notification-Level No. 3 Rating:
    - .1 Situation:
      - .1 Continued and repeated non-compliance with health and safety requirements by the General Contractor or by sub-contractor(s); or
      - .2 The occurrence of a serious accident on site resulting in serious bodily injury or death.
    - .2 Action:
      - .1 Formal letter issued to General Contractor with an order to "Immediately Stop Work" until so notified to proceed.
      - .2 Review of all non-compliance and/or accident occurrences in the project with possible investigation by The Department of Fisheries and Oceans.
      - .3 Based on outcome of the review/investigation, work could be suspended or taken out of the Contractor's hands in accordance with the General Conditions.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.23 NON COMPLIANCE AND DISCIPLINARY MEASURES**  
**(CONT'D)**

- .7 (cont'd)
  - .3 (cont'd)
    - .3 The term "serious accident" used herein shall have the same meaning as defined in the Canadian Dictionary of Safety Terms - 1987 issue from the Canadian Society of Safety Engineers (C.S.S.E.).
- .8 Decision on which rating level to be placed on any given Non-Compliance Notification will be determined solely by Departmental Representative.
- .9 Further details on the disciplinary system will be provided at the pre-construction Health and Safety meeting after contract award.
- .10 Be responsible to fully brief workers and sub-contractors on the operation and importance of this system.

**1.24 DIVING OPERATIONS**

- .1 All diving work to comply fully with the requirements of the latest editions of CSA Standard Z275.2 "Occupational Safety Code for Diving Operations", CSA Z275.4 "Competency Standards for Diving Hyperbaric Chamber and Remotely Operated Vehicle Operations", and CSA Standard Z180.1 "Compressed Breathing Air and Systems".
- .2 Dive personnel must meet the minimum competency requirements of the latest edition of CSA Z275.4 and all divers must possess a valid Category I Diving Certificate, or an unrestricted surface supply certificate.
- .3 Diving in free-swim mode is not permitted at the work site.
- .4 Divers must have a current (less than one year) validated medical examination certificate from a licensed diving physician in Newfoundland and Labrador, who is knowledgeable and competent in diving and hyperbaric medicine, for all dives.

**PART 1 - GENERAL**

**1.1 RELATED WORK**

- .1 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

**1.2 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.

**1.3 FIRES**

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

**1.4 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, paint thinner, 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 methods 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 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.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.4 DISPOSAL OF WASTES AND HAZARDOUS MATERIALS**  
**(CONT'D)**

- .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.

**1.5 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 exceedances are noted, 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.

**1.6 PERMITS**

- .1 All guidelines and instructions stated on permits must be strictly adhered to.

**1.7 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.



**PART 1 - GENERAL**  
**(CONT'D)**

**1.7 WORK ADJACENT TO WATERWAYS**  
**(CONT'D)**

- .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 within 100 m of spawning beds.
- .8 Do not refuel any type of equipment within 100 m of a water body. Maintain equipment in good working condition with no fluid leaks, loose hoses or fittings.

**1.8 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 the 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.

**PART 1 - GENERAL  
(CONT'D)**

**1.8 POLLUTION CONTROL  
(CONT'D)**

- .8 Provide a floating debris containment boom whenever any of the Contractors methods of work allow for the potential of floating debris.

**1.9 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.

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- .1 Inspection and testing, administrative and enforcement requirements.
- .2 Tests and mix designs.
- .3 Mock-ups.
- .4 Mill tests.
- .5 Equipment and system adjust and balance.

**1.2 RELATED SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 78 00 - Closeout Submittals.

**1.3 INSPECTION**

- .1 Facilitate Departmental Representative's access to Work. If part of Work is being fabricated at locations other than construction site, make preparations to allow access to such Work whenever it is in progress.
- .2 Give timely notice requesting inspection of Work designated for special tests, inspections or approvals by Departmental Representative or by inspection authorities having jurisdiction.
- .3 If Contractor covers or permits to be covered Work designated for special tests, inspections or approvals before such is made, uncover Work until particular inspections or tests have been fully and satisfactorily completed and until such time as Departmental Representative gives permission to proceed. Pay costs to uncover and make good such Work.
- .4 In accordance with the General Conditions, Departmental Representative may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents.

**PART 1 - GENERAL  
(CONT'D)**

**1.4 INDEPENDENT INSPECTION AGENCIES**

- .1 Departmental Representative will engage and pay for service of Independent Inspection and Testing Agencies for purpose of inspecting and testing portions of Work except for the following which remain part of Contractor's responsibilities:
  - .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
  - .2 Inspection and testing performed exclusively for Contractor's convenience.
  - .3 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.
  - .4 Mill tests and certificates of compliance.
  - .5 Tests as specified within various sections designated to be carried out by Contractor under the supervision of Departmental Representative.
  - .6 Additional tests specified in Clause 1.4.2.
- .2 Where tests or inspections by designated Testing Agency reveal work not in accordance with contract requirements, Contractor shall pay costs for additional tests or inspections as Departmental Representative may require to verify acceptability of corrected work.
- .3 Employment of inspection and testing agencies by Departmental Representative does not relax responsibility to perform Work in accordance with Contract Documents.

**1.5 ACCESS TO WORK**

- .1 Furnish labour and facility to provide access to the work being inspected and tested.
- .2 Cooperate to facilitate such inspections and tests.
- .3 Make good work disturbed by inspections and tests.

**1.6 PROCEDURES**

- .1 Notify Departmental Representative sufficiently in advance of when work is ready for tests, in order for Departmental Representative to make attendance arrangements with Testing Agency. When directed by Departmental Representative, notify such Agency directly.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.6 PROCEDURES**  
**(CONT'D)**

- .2 Submit representative samples of materials specified to be tested. Deliver in required quantities to Testing Agency. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.
- .3 Provide labour and facilities to obtain and handle samples on site. Provide sufficient space on site for Testing Agency's exclusive use to store equipment and cure test samples.

**1.7 REJECTED WORK**

- .1 Remove and replace defective Work, whether result of poor workmanship, use of defective or damaged products and whether incorporated in Work or not, which has been identified by Departmental Representative as failing to conform to Contract Documents.
- .2 Make good damages to existing or new work, including work of other Contracts, resulting from removal or replacement of defective work.

**1.8 TESTING BY CONTRACTOR**

- .1 Provide all necessary instruments, equipment and qualified personnel to perform tests designated as Contractor's responsibilities herein or elsewhere in the Contract Documents.
- .2 At completion of tests, turn over two (2) copies of fully documented test reports to Departmental Representative. Additionally, obtain other copies in sufficient quantities to enable one (1) complete set of test reports to be placed in each of the maintenance manuals specified in Section 01 78 00 – Closeout Submittals.
- .3 Submit mill test certificates and other certificates as specified in various sections.
- .4 Submit adjustment and balancing reports for mechanical, electrical and building equipment systems specified in trade sections.
- .5 Furnish test results and mix designs as specified in various sections.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.9 MOCK-UPS**

- .1 Prepare mock-ups for Work specifically requested in various trade sections. Include in each mock-up all related work components representative of final assembly.
- .2 Construct in locations acceptable to Departmental Representative.
- .3 Prepare mock-ups for Departmental Representative's review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.
- .4 Failure to prepare mock-ups in ample time is not considered sufficient reason for an 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 a schedule fixing dates for preparation.
- .6 Remove mock-up at conclusion of Work or when directed by Departmental Representative unless approval is given to remain as part of Work.

## **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 damage resulting from Contractor's use of roads.

### **1.2 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.

### **1.3 DEPARTMENTAL REPRESENTATIVE'S SITE OFFICE**

- .1 Provide or construct a separate site office for the use of the Departmental Representative and the site representative. The building must be in place prior to commencement of work.
- .2 Provide heating system to maintain 22 degrees C inside temperature at -20 degrees C outside temperature.
- .3 The building will be approximately 2400 mm x 3600 mm. It will have a suitable frame covered with a weatherproof siding and lined with plywood or other approved material. The floor will be of 19 mm thick material. It will be provided with suitable window with at least 1 m<sup>2</sup> of glass and arranged to provide at least 0.5 m<sup>2</sup> of screened opening. The door will be fitted with a lockset and two (2) keys.
- .4 The office will be equipped with a drafting chair and a 900 mm by 1500 mm table having a hinged, smooth wooden top suitable for drafting.
- .5 Install electrical lighting system to provide minimum 750 lux using surface mounted, shielded commercial fixtures with 10% upward light component.
- .6 Maintain office in clean condition.
- .7 Arrange and pay for telephone and facsimile machine in Departmental Representative's office for the site representative's exclusive use. Long distance calls or faxes placed on this phone by the Departmental Representative or site inspector will be paid by the Departmental Representative.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.3 DEPARTMENTAL REPRESENTATIVE'S SITE OFFICE**  
**(CONT'D)**

- .8 Contractor may, on approval of Departmental Representative, provide cellular or mobile phone. If approval to use cellular or mobile phone is granted, contractor will be responsible for all service, air time, license and network access fees, and all other fees or charges required to utilize the phone as intended by the manufacturer.

**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 and 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 SCAFFOLDING**

- .1 Design, construct and maintain scaffolding in rigid, secure and safe manner in accordance with CAN/CSA-S269.2-M87 (R2003).
- .2 Erect scaffolding independent of walls. Remove when no longer required.



**PART 1 - GENERAL**  
**(CONT'D)**

**1.8 CONSTRUCTION SIGNS AND NOTICES**

- .1 Contractor or sub-contractor 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 CAN/CSA-Z321-96 (R2001).
- .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.

**1.9 REMOVAL OF TEMPORARY FACILITIES**

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

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- .1 Barriers.
- .2 Traffic Controls.

**1.2 INSTALLATION AND REMOVAL**

- .1 Provide temporary controls in order to execute work expeditiously.
- .2 Remove from site all such work after use.

**1.3 HOARDING**

- .1 Erect temporary site enclosure using new 1.2 m high snow fence wired to rolled steel "T" bar fence posts spaced at 2.4 m centres. Provide one lockable truck gate. Maintain fence in good repair.

**1.4 GUARD RAILS AND BARRICADES**

- .1 Provide secure, rigid guard rails and barricades around open excavations.
- .2 Provide as required by governing authorities.

**1.5 ACCESS TO SITE**

- .1 Provide and maintain access to adjacent harbour facilities.

**1.6 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 the public.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.7 FIRE ROUTES**

- .1 Maintain access to property including overhead clearances for use by emergency response vehicles.

**1.8 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.

## **PART 1 - GENERAL**

### **1.1 GENERAL**

- .1 Use new material and equipment unless otherwise specified.
- .2 Within seven (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 manufacturer's installation or application instructions;
  - .5 evidence of arrangements to procure.
  - .6 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.

### **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 rests solely with the Departmental Representative in accordance with the General Conditions.

### **1.3 ACCEPTABLE MATERIALS AND ALTERNATIVES**

- .1 Acceptable Materials: When materials specified include trade names or trade marks or manufacturer's or supplier's name as part of the material description, select and only use one of the names listed for incorporation into the Work.
- .2 Alternative Materials: Submission of alternative materials to trade names or manufacturer's names specified must be done during the bidding period following procedures indicated in the Instructions to Bidders.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.3 ACCEPTABLE MATERIALS AND ALTERNATIVES**  
**(CONT'D)**

- .3 Substitutions: After acceptance of bid, substitution of a specified material will be dealt with as a change to the Work in accordance with the General Conditions of the Contract.

**1.4 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.

**1.5 AVAILABILITY**

- .1 Immediately notify Departmental Representative in writing of unforeseen or unanticipated material delivery problems by manufacturer. Provide support documentation as per clause 1.1.2 above.

**1.6 WORKMANSHIP**

- .1 Ensure quality of work is of highest standard, executed by workers skilled in respective duties for which they are employed.
- .2 Remove unsuitable or incompetent workers from site as stipulated in General Conditions.
- .3 Ensure cooperation of workers in laying out work. Maintain efficient and continuous supervision on site at all times.
- .4 Coordinate work between trades and sub-contractors.
- .5 Coordinate placement of openings, sleeves and accessories.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.7 FASTENINGS - GENERAL**

- .1 Provide metal fastenings and accessories in same texture, colour and finish as base metal in which they occur. Prevent electrolytic action between dissimilar metals. Use non-corrosive fasteners, anchors and spacers for securing exterior work and in humid areas.
- .2 Space anchors within limits of load bearing or shear capacity and ensure that they provide positive permanent anchorage. Wood or organic material plugs not acceptable.
- .3 Keep exposed fastenings to minimum, space evenly and lay out neatly.
- .4 Fastenings which cause spalling or cracking of material to which anchorage is made, are not acceptable.
- .5 Do not use explosive actuated fastening devices unless approved by Departmental Representative. See Section 01 35 28 – Health & Safety Requirements, on Health and Safety in this regard.

**1.8 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 (1) 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.

**1.9 STORAGE, HANDLING AND PROTECTION**

- .1 Deliver, handle and store materials in manner to prevent 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.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.9 STORAGE, HANDLING AND PROTECTION**  
**(CONT'D)**

- .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 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- .6 Store sheet materials and lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
- .8 Immediately remove damaged or rejected materials from site.
- .9 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

**1.10 CONSTRUCTION EQUIPMENT AND PLANT**

- .1 On request, prove to the satisfaction of Departmental Representative that the construction equipment and plant are adequate to manufacture, transport, place and finish work to quality and production rates specified. If inadequate, replace or provide additional equipment or plant as directed.
- .2 Maintain construction equipment and plant in good operating order. Prevent oil and other contaminant leaks. Should any contaminant leak onto ground or into the water, take immediate and appropriate measures to contain, clean-up and dispose in an environmentally responsible manner.

**PART 1 - GENERAL**

**1.1 GENERAL**

- .1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
- .2 Store volatile wastes in covered metal containers, and remove from premises at end of each working day.
- .3 Prevent accumulation of wastes which create hazardous conditions.
- .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 accumulation of waste materials 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 the site or building each day.

**1.4 FINAL CLEANING**

- .1 In preparation for acceptance of the Work perform 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.



**PART 1 - GENERAL**

**1.1 RELATED SECTIONS**

- .1 Section 01 35 43 - Environmental Procedures.
- .2 Section 03 30 00 - Cast-in-Place Concrete.
- .3 Section 06 05 73 - Wood Treatment.
- .4 Section 31 53 16 - Structural Timber.

**1.2 WASTE MANAGEMENT PLAN**

- .1 Prior to commencement of work, prepare waste Management Workplan.
- .2 Workplan to include:
  - .1 Waste audit.
  - .2 Waste reduction practices.
  - .3 Material source separation process.
  - .4 Procedures for sending recyclables to recycling facilities.
  - .5 Procedures for sending non-salvageable items and waste to approved waste processing facility or landfill site.
  - .6 Training and supervising workforce on waste management at site.
- .3 Workplan to incorporate waste management requirements specified herein and in other sections of the Specifications.
- .4 Develop Workplan in collaboration with all subcontractors to ensure all waste management issues and opportunities are addressed.
- .5 Submit copy of Workplan to Departmental Representative for review and approval.
  - .1 Make revisions to Plan as directed by Departmental Representative.
- .6 Implement and manage all aspects of Waste Management Workplan for duration of work.
- .7 Revise Plan as work progresses addressing new opportunities for diversion of waste from landfill.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.3 WASTE AUDIT**

- .1 At project start-up, conduct waste audit of:
  - .1 Site conditions identifying salvageable and non-salvageable items and waste resulting from demolition and removal work.
  - .2 Projected waste resulting from product packaging and from material leftover after installation work.
- .2 Develop written list. Record type, composition and quantity of various salvageable items and waste anticipated, reasons for waste generation and operational factors which contribute to waste.

**1.4 WASTE REDUCTION**

- .1 Based on waste audit, develop waste reduction program.
- .2 Structure program to prioritize actions, with waste reduction as first priority, followed by salvage and recycling effort, then disposal as solid waste.
- .3 Identify materials and equipment to be:
  - .1 Protected and turned over to Departmental Representative when indicated.
  - .2 Salvaged for resale by Contractor.
  - .3 Sent to recycling facility.
  - .4 Sent to waste processing/landfill site for their recycling effort.
  - .5 Disposed of in approved landfill site.
- .4 Reduce construction waste during installation work. Undertake practices which will minimize waste and optimize full use of new materials on site, such as:
  - .1 Use of a central cutting area to allow for easy access to off-cuts;
  - .2 Use of off-cuts for blocking and bridging elsewhere.
  - .3 Use of effective and strategically placed facilities on site for storage and staging of left-over or partially cut materials (such as gypsum board, plywood, ceiling tiles, insulation, etc.) to allow for easy incorporation into work whenever possible avoiding unnecessary waste.
- .5 Develop other strategies and innovative procedures to reduce waste such as minimizing the extent of packaging used for delivery of materials to site, etc.

**PART 1 - GENERAL  
(CONT'D)**

**1.5 MATERIAL SOURCE SEPARATION PROCESS**

- .1 Develop and implement material source separation process at commencement of work as part of mobilization and waste management at site.
- .2 Provide on-site facilities to collect, handle and store anticipated quantities of reusable, salvageable and recyclable materials.
  - .1 Use suitable containers for individual collection of items based on intended purpose.
  - .2 Locate to facilitate deposit but without hindering daily operations of existing tenants.
  - .3 Clearly mark containers and stockpiles as to purpose and use.
- .3 Perform demolition and removal of existing structure components and equipment following a systematic deconstruction process.
  - .1 Separate materials and equipment at source, carefully dismantling, labelling and stockpiling alike items for the following purposes:
    - .1 Reinstallation into the work where indicated.
    - .2 Salvaging reusable items not needed in project which Contractor may sell to other parties. Sale of such items not permitted on site.
    - .3 Sending as many items as possible to locally available recycling facility.
    - .4 Segregating remaining waste and debris into various individual waste categories for disposal in a "non-mixed state" as recommended by waste processing/landfill sites.
- .4 Isolate product packaging and delivery containers from general waste stream. Send to recycling facility or return to supplier/manufacturer.
- .5 Send leftover material resulting from installation work for recycling whenever possible.
- .6 Establish methods whereby hazardous and toxic waste materials, and their containers, encountered or used in the course of work are properly isolated, stored on site and disposed of in accordance with applicable laws and regulations from authorities having jurisdiction.
- .7 Isolate and store existing materials and equipment identified for re-incorporation into the Work. Protect against damage.

**PART 1 - GENERAL  
(CONT'D)**

**1.6 WORKER TRAINING AND SUPERVISION**

- .1 Provide adequate training to workforce, through meetings and demonstrations, to emphasize purpose and worker responsibilities in carrying out the Waste Management Plan.
- .2 Waste Management Coordinator: designate full-time person on site, having knowledge of the purpose and content of Waste Management Plan to:
  - .1 Oversee and supervise waste management during work.
  - .2 Provide instructions and directions to all workers and subcontractors on waste reduction, source separation and disposal practices.
- .3 Post a copy of Plan in a prominent location on site for review by workers.

**1.7 CERTIFICATION OF MATERIAL DIVERSION**

- .1 Submit to Departmental Representative, copies of certified weigh bills from authorized waste processing sites and sale receipts from recycling/reuse facilities confirming receipt of building materials and quantity of waste diverted from landfill.
- .2 Submit data at pre-determined project milestones as determined by Departmental Representative.
- .3 Compare actual quantities diverted from landfill with projections made during waste audit.

**1.8 DISPOSAL REQUIREMENTS**

- .1 Burying or burning of rubbish and waste materials is prohibited.
- .2 Disposal of waste, volatile materials, mineral spirits, oil, paint, paint thinner or unused preservative material into waterways, storm, or sanitary sewers is prohibited.
- .3 Do not dispose of preservative treated wood through incineration.
- .4 Do not dispose of preservative treated wood with other materials destined for recycling or reuse.

- .5 Dispose of treated wood, end pieces, wood scraps and sawdust at a sanitary landfill.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.8 DISPOSAL REQUIREMENTS**  
**(CONT'D)**

- .6 Dispose of waste only at approved waste processing facility or landfill sites approved by authority having jurisdiction.
- .7 Contact the authority having jurisdiction prior to commencement of work, to determine what, if any, demolition and construction waste materials have been banned from disposal in landfills and at transfer stations. Take appropriate action to isolate such banned materials at site of work and dispose in strict accordance with provincial and municipal regulations.
- .8 Transport waste intended for landfill in separated condition, following rules and recommendations of Landfill Operator in support of their effort to divert, recycle and reduce amount of solid waste placed in landfill.
- .9 Collect, bundle and transport salvaged materials to be recycled in separated categories and condition as directed by recycling facility. Ship materials only to approved recycling facilities.
- .10 Sale of salvaged items by Contractor to other parties not permitted on site.

## PART 1 - GENERAL

### 1.1 DESCRIPTION

- .1 Project Record Documents as follows:
  - .1 As-built drawings;
  - .2 As-built specifications;
  - .3 Reviewed shop drawings.

### 1.2 PROJECT RECORD DOCUMENTS

- .1 Departmental Representative will provide two (2) white print sets of contract drawings and two (2) copies of Specifications Manual specifically for "as-built" purposes.
- .2 Maintain at site one (1) set of the contract drawings and specifications to record actual as-built site conditions.
- .3 Maintain up-to-date, real time as-built drawings and specifications in good condition and make available for inspection by the Departmental Representative at any time during construction.
- .4 As-Built Drawings:
  - .1 Record changes in red ink on the prints. Mark only on one (1) set of prints and at completion of project and prior to final inspection, neatly transfer notations to second set (also by use of red ink). Submit both sets to Departmental Representative. All drawings of both sets shall be stamped "As-built Drawings" and be signed and dated by Contractor.
  - .2 Show all modifications, substitutions and deviations from what is shown on the contract drawings or in specifications.
  - .3 Record following information:
    - .1 Horizontal and vertical location of various elements in relation to Geodetic Datum.
    - .2 Field changes of dimension and detail.
    - .3 All design elevations, sections, and details dimensioned and marked-up to consistently report finished installation conditions.
    - .4 Any details produced in the course of the contract by the Departmental Representative to supplement or to change existing design drawings must also be marked-up and dimensioned to reflect final as-built conditions and appended to the as-built drawing document.
    - .5 All change orders issued over the course of the contract must be documented on the finished as-built documents, accurately and consistently depicting the changed condition as it applies to all affected drawing details.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.2 PROJECT RECORD DOCUMENTS**  
**(CONT'D)**

- .5 As-built Specifications: legibly mark in red each item to record actual construction, including:
  - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly items substituted from that specified.
  - .2 Changes made by Addenda and Change Orders.
  - .3 Mark up both copies of specifications; stamp "as-built", sign and date similarly to drawings as per above clause.
  
- .6 Maintain As-built documents current as the contract progresses. Departmental Representative will conduct reviews and inspections of the documents on a regular basis. Frequency of reviews will be subject to Departmental Representative's discretion. Failure to maintain as-builts current and complete to satisfaction of the Departmental Representative shall be subject to financial penalties in the form of progress payment reductions and holdback assessments.

**1.3 REVIEWED SHOP DRAWINGS**

- .1 Compile two (2) full sets of all reviewed shop drawings.

**1.4 OPERATIONS AND MAINTENANCE MANUALS**

- .1 Provide three (3) copies of operations and maintenance manuals for all equipment installed in the works as applicable.

## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 01 33 00 – Submittal Procedures.
- .2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .3 Section 03 20 00 - Concrete Reinforcing
- .4 Section 03 30 00 - Cast-in-Place Concrete.

### **1.2 REFERENCES**

- .1 Canadian Standards Association (CSA)
  - .1 CAN/CSA-A23.1-04, Concrete Materials and Methods of Concrete Construction.
  - .2 CAN/CSA-086-01 (R2006), Engineering Design in Wood (Limit States Design).
  - .3 CSA 0121-M1978 (R2003), Douglas Fir Plywood.
  - .4 CSA 0151-04, Canadian Softwood Plywood.
  - .5 CSA 0153-M1980 (R2003), Poplar Plywood.
  - .6 CAN3-0188.0-M78, Standard Test Methods for Mat-Formed Wood Particleboards and Waferboard.
  - .7 CSA 0437 Series-93 (R2001), Standards for OSB and Waferboard.
  - .8 CSA S269.1-1975 (R2003), Falsework for Construction Purposes.
  - .9 CAN/CSA-S269.3-M92 (R2003), Concrete Formwork.

### **1.3 SHOP DRAWINGS**

- .1 Submit shop drawings for formwork and falsework in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special architectural exposed finishes, ties, liners, and locations of temporary embedded parts. Comply with CSA S269.1, for falsework drawings. Comply with CAN/CSA-S269.3 for formwork drawings.
- .3 Indicate formwork design data, such as permissible rate of concrete placement, and temperature of concrete, in forms.
- .4 Indicate sequence of erection and removal of formwork/falsework as directed by Departmental Representative.



**PART 1 - GENERAL**  
**(CONT'D)**

**1.3 SHOP DRAWINGS**  
**(CONT'D)**

- .5 Each shop drawing submission shall bear stamp and signature of qualified professional engineer registered or licensed in Province of Newfoundland and Labrador, Canada.

**1.4 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and the Waste Reduction Workplan.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away from children.
- .4 Use sealers, form release and stripping agents that are non-toxic, biodegradable and have zero or low VOC's.

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- .1 Formwork materials:
  - .1 Use formwork materials to CAN/CSA-A23.1.
- .2 Form ties:
  - .1 Removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface.
- .3 Form release agent: non-toxic, chemically active release agents containing compounds that react with free lime present in concrete to provide water insoluble soaps, preventing set of film of concrete in contact with form.
- .4 Falsework materials: to CSA-S269.1.
  - .1 Materials required to bear grade marks, or be accompanied with certificates, test reports or other proof of conformity.

**PART 2 – PRODUCTS**  
**(CONT'D)**

**2.1 MATERIALS**  
**(CONT'D)**

- .5 Pre-moulded joint fillers:
  - .1 Bituminous impregnated fibreboard to ASTM D1751.
- .6 Bond Breaker:
  - .1 Impermeable tube formed of polyvinylchloride, rubber or similar material to the approval of the Departmental Representative. Internal diameter equal to dowels.

**PART 3 - EXECUTION**

**3.1 FABRICATION AND ERECTION**

- .1 Verify lines, levels and centers before proceeding with formwork/falsework and ensure dimensions agree with drawings.
- .2 Obtain Departmental Representative's approval for use of earth forms framing openings not indicated on drawings.
- .3 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.
- .4 Fabricate and erect falsework in accordance with CSA S269.1.
- .5 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CAN/CSA-A23.1
- .6 Align form joints and make watertight. Keep form joints to minimum.
- .7 Use 25 mm chamfer strips on external corners and/or 25 mm fillets at interior corners, joints, unless specified otherwise.
- .8 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.
- .9 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections. Assure that all anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.

**PART 3 - EXECUTION**  
**(CONT'D)**

**3.1 FABRICATION AND ERECTION**  
**(CONT'D)**

- .10 Clean formwork in accordance with CAN/CSA-A23.1, before placing concrete.

**3.2 REMOVAL AND RESHORING**

- .1 Leave formwork in place for following minimum periods of time after placing concrete.
- .1 Seven (7) days for walls and sides of beams.
  - .2 Seven (7) days for columns.
  - .3 Five (5) days for beam soffits, slabs, decks and other structural members, or three (3) days when replaced immediately with adequate shoring to standard specified for falsework.
  - .4 Five (5) days for footings and abutments.
- .2 Remove formwork when concrete has reached 75% of its design strength or minimum period noted above, whichever comes later, and replace immediately with adequate reshoring.
- .3 Provide all necessary reshoring of members where early removal of forms may be required or where members may be subjected to additional loads during construction as required.
- .4 Space reshoring in each principal direction at not more than 3000 mm apart.
- .5 Re-use formwork and falsework subject to requirements of CAN/CSA-A23.1.

**3.3 JOINT FILLERS**

- .1 Locate and form expansion joints as indicated. Install joint filler in all joints.
- .2 Use 13 mm thick joint filler to separate slab-on-grade and extend joint filler from bottom of slab to within 25 mm of finished slab surfaces unless indicated otherwise.

**3.4 JOINT SEALANT**

- .1 Fill expansion and control joints with sealer as per manufacturer's instructions.

**PART 3 - EXECUTION**  
**(CONT'D)**

**3.5 CONSTRUCTION JOINTS**

- .1 Apply bonding agent to entire face of previously poured concrete prior to commencing adjacent pour.
- .2 Sawcut construction joints to a depth of 25 mm from top of reinforced concrete deck and fill with sealer as per manufacturer's instructions.

**PART 1 - GENERAL**

**1.1 RELATED SECTIONS**

- .1 Section 01 33 00 – Submittal Procedures.
- .2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .3 Section 03 10 00 - Concrete Forming and Accessories.
- .4 Section 03 30 00 - Cast-in-Place Concrete.

**1.2 REFERENCES**

- .1 American Concrete Institute (ACI).
  - .1 ACI 315R-80, Manual of Engineering and Placing Drawings for Reinforced Concrete Structure.
- .2 American National Standards Institute/American Concrete Institute (ANSI/ACI).
  - .1 ANSI/ACI 315-80, Details and Detailing of Concrete Reinforcement.
- .3 Canadian Standards Association (CSA).
  - .1 CAN/CSA-A23.1-04, Concrete Materials and Methods of Concrete Construction.
  - .2 CSA-A23.3-04, Design of Concrete Structures for Buildings.
  - .3 CSA G30.3-M1983 (R1998), Cold Drawn Steel Wire for Concrete Reinforcement.
  - .4 CSA G30.5-M1983 (R1998), Welded Steel Wire Fabric for Concrete Reinforcement.
  - .5 CSA G30.14-M1983 (R1998), Deformed Steel Wire for Concrete Reinforcement.
  - .6 CSA G30.15-M1983 (R1991), Welded Deformed Steel Wire Fabric for Concrete Reinforcement.
  - .7 CAN/CSA-G30.18-M92 (R2007), Billet-Steel Bars for Concrete Reinforcement.
  - .8 CAN/CSA-G40.21-04, Structural Quality Steels.
  - .9 CSA W186-M1990 (R2007), Welding of Reinforcing Bars in Reinforced Concrete Construction.
- .4 American Society for Testing & Materials (ASTM).
  - .1 ASTM A123/A123M-09, zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.3 SHOP DRAWINGS**

- .1 Submit shop drawings including placing of reinforcement in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate on shop drawings, bar bending details, lists, quantities of reinforcement, sizes, spacings, locations of reinforcement and mechanical splices if approved by Departmental Representative, with identifying code marks to permit correct placement without reference to structural drawings. Indicate sizes, spacings and locations of chairs, spacers and hangers. Submit shop drawing for each type of chair, spacer or hanger to be used. Prepare reinforcement drawings in accordance with the Reinforcing Steel Manual of Standard Practice - by Reinforcing Steel Institute of Canada, ANSI/ACI 315 and ACI 315R, Manual of Engineering and Placing Drawings for Reinforced Concrete Structure.

**1.4 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and the Waste Reduction Workplan.

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- .1 Substitute different size bars only if permitted in writing by Departmental Representative.
- .2 Reinforcing steel: billet steel, grade 400, deformed bars to CAN/CSA-G30.18, unless indicated otherwise.
- .3 Reinforcing steel: weldable low alloy steel deformed bars to CAN/CSA-30.18.
- .4 Cold-drawn annealed steel wire ties: to CSA G30.3.
- .5 Welded steel wire fabric: to CSA G30.5. Provide in flat sheets only.
- .6 Chairs, bolsters, bar supports, spacers: to CAN/CSA-A23.1.
- .7 Mechanical splices: subject to approval of Departmental Representative.

**PART 2 - PRODUCTS**  
**(CONT'D)**

**2.2 FABRICATION**

- .1 Fabricate reinforcing steel in accordance with CAN/CSA-A23.1, ANSI/ACI 315, and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada. ACI 315R, Manual of Engineering and Placing Drawings for Reinforced Concrete Structures unless indicated otherwise.
- .2 Obtain Departmental Representative's approval for locations of reinforcement splices other than those shown on placing drawings.
- .3 Upon approval of Departmental Representative, weld reinforcement in accordance with CSA W186.
- .4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

**2.3 SOURCE QUALITY CONTROL**

- .1 Provide Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum two (2) weeks prior to commencing reinforcing work.
- .2 Upon request inform Departmental Representative of proposed source of material to be supplied.

**PART 3 - EXECUTION**

**3.1 FIELD BENDING**

- .1 Do not field bend or field weld reinforcement except where indicated or authorized by Departmental Representative.
- .2 When field bending is authorized, bend without heat, applying a slow and steady pressure.
- .3 Replace bars which develop cracks or splits.

**PART 3 - EXECUTION**  
**(CONT'D)**

**3.2 PLACING REINFORCEMENT**

- .1 Place reinforcing steel as indicated on the reviewed placing drawings and in accordance with CAN/CSA-A23.1.
- .2 Use approved type chairs to locate the reinforcing steel at the proper grade.
- .3 Tie reinforcement where spacing in each direction is:
  - .1 Less than 300 mm: tie at alternate intersections.
  - .2 300 mm or more: tie at each intersection.
- .4 Prior to placing concrete, obtain Departmental Representative's approval of reinforcing material and placement.
- .5 Ensure cover to reinforcement is maintained during concrete pour.

**3.3 CLEANING**

- .1 Clean reinforcing before placing concrete to CAN/CSA A23.1.



## **PART 1 - GENERAL**

### **1.1 DESCRIPTION**

- .1 This section specifies requirements for supply, placing, finishing, protecting and curing cast-in-place concrete.

### **1.2 RELATED SECTIONS**

- .1 Section 01 33 00 – Submittal Procedures.
- .2 Section 03 10 00 - Concrete Forming and Accessories.
- .3 Section 03 20 00 - Concrete Reinforcing.

### **1.3 REFERENCES**

- .1 American Society for Testing and Materials (ASTM)
  - .1 ASTM C109/C109M-05, Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 in. or 50 mm Cube Specimens).
  - .2 ASTM C260-06, Specification for Air-Entraining Admixtures for Concrete.
  - .3 ASTM C494/C494M-05a, Specification for Chemical Admixtures for Concrete.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .3 Canadian Standards Association (CSA)
  - .1 CAN/CSA-A3000-031 (R2006).
  - .2 CAN/CSA-A23.1-04, Concrete Materials and Methods of Concrete Construction.
  - .3 CAN/CSA-A23.2-04, Methods of Test for Concrete.

### **1.4 CERTIFICATES**

- .1 Submit certificates in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Minimum two (2) weeks prior to starting concrete work submit to Departmental Representative manufacturer's test data and certification by qualified independent inspection and testing laboratory that following materials will meet specified requirements:

**PART 1 - GENERAL**  
**(CONT'D)**

**1.4 CERTIFICATES**  
**(CONT'D)**

- .2 (Cont'd)
  - .1 Portland cement.
  - .2 Blended hydraulic cement.
  - .3 Supplementary cementing materials.
  - .4 Grout.
  - .5 Admixtures.
  - .6 Aggregates.
  - .7 Water.
  - .8 Joint filler.
  - .9 Joint Sealant.
- .3 Provide certification that mix proportions selected will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with CAN/CSA-A23.1.
- .4 Provide certification that plant, equipment, and materials to be used in concrete comply with requirements of CAN/CSA-A23.1.

**1.5 STORAGE OF MATERIALS**

- .1 Store materials to prevent contamination or deterioration.
- .2 Provide adequate storage facilities for materials to ensure a continuous supply of these materials during batching operations.
- .3 Store cement in weather tight facility.

**1.6 QUALITY ASSURANCE**

- .1 Minimum two (2) weeks prior to starting concrete work, submit proposed quality control procedures to Departmental Representative for the following items:
  - .1 Cold weather concrete.
  - .2 Curing.
  - .3 Finishes.
  - .4 Formwork removal.
  - .5 Joints.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.7 WASTE MANAGEMENT AND DISPOSAL**

- .1 Use trigger operated spray nozzles for water hoses.
- .2 Designate a cleaning area for tools to limit water use and runoff.
- .3 Carefully coordinate the specified concrete work with weather conditions.
- .4 Ensure emptied containers are sealed and stored safely for disposal away from children.
- .5 Prevent plasticizers, water-reducing agents and air-entraining agents from entering drinking water supplies or streams. Using appropriate safety precautions, collect liquid or solidify liquid with an inert, noncombustible material and remove for disposal. Dispose of all waste in accordance with applicable local, provincial and national regulations.
- .6 Choose least harmful, appropriate cleaning method which will perform adequately.

**1.8 MEASUREMENT FOR PAYMENT**

- .1 This portion of the work will not be measured for payment, but will be included in the lump sum amount of the contract.

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- .1 Cement to CAN/CSA-A3001, Type GU.
- .2 Supplementary cementing materials: to CAN/CSA-A3001.
- .3 Cementitious hydraulic slag: to CAN/CSA-A3001.
- .4 Water: to CAN/CSA-A23.1.
- .5 Aggregates: to CAN/CSA-A23.1. Coarse aggregates to be normal density.
- .6 Air entraining admixture: to ASTM C260.
- .7 Chemical admixtures: to ASTM C494/C494M. Departmental Representative to approve accelerating or set retarding admixtures during cold and hot weather placing.

**PART 2 - PRODUCTS**  
**(CONT'D)**

**2.1 MATERIALS**  
**(CONT'D)**

- .8 Concrete retarders: to ASTM C494/C494M. Do not allow moisture of any kind to come in contact with the retarder film.
- .9 Curing compound: curing compounds are not to be used.
- .10 Pre-moulded joint fillers:
  - .1 Sponge rubber: to ASTM D1752, Type I, flexible grade.

**2.2 MIXES**

- .1 Proportion concrete in accordance with CAN/CSA-A23.1, Clause 4.3.
- .2 Proportion concrete to comply with Alternate 1, Table 2 in CAN/CSA-A23.1 and following requirements:
  - .1 Cement:
    - .1 Type GU Portland cement.
    - .2 Minimum compressive strength: 35 MPa at 28 days.
    - .3 Class of exposure: C1.
    - .4 Minimum cement content: 385 kg/m<sup>3</sup> of concrete.
    - .5 20 mm nominal size coarse aggregate.
    - .6 Air content 5% to 8%.
    - .7 Density of air-dry concrete in range of 2240 kg/m<sup>3</sup> to 2400 kg/m<sup>3</sup>.
    - .8 Slump at time and point of discharge 50 mm to 100 mm.
- .3 When the Contractor wishes to purchase concrete from a ready mix concrete supplier, submit a letter from the supplier certifying the following:
  - .1 That plant and equipment is certified and all materials to be used in the concrete comply with the requirements of CAN/CSA-A23.1.
  - .2 That the mix proportions selected will produce concrete of the specified quality and yield. Indicate mix proportions and sources of all materials.
  - .3 That the strengths will comply with the strengths specified herein.
- .4 When the Contractor wishes to mix concrete on site, identify the source of aggregates and submit samples of fine and coarse aggregates to a testing laboratory for testing and trial mixes in order to determine a suitable mix design. The testing laboratory, at Contractor's cost, will test the trial mix for slump, air content, density and strength. The results of these tests will be submitted to the Departmental Representative to be reviewed for compliance with the specification. This review must be completed before permission to place concrete is given.
  - .1 The sand, gravel, water and air entraining agent should be mixed prior to the addition of cement and water reducer.

**PART 2 - PRODUCTS**  
**(CONT'D)**

**2.2 MIXES**  
**(CONT'D)**

- .5 Weigh aggregates, cement, water and admixture when batching. No alternative methods of measuring will be permitted.
- .6 Do not use calcium chloride.

**PART 3 - EXECUTION**

**3.1 PREPARATION**

- .1 Obtain Departmental Representative's approval before placing concrete. Provide 24 hours' notice prior to placing of concrete.
- .2 Pumping of concrete is permitted only after approval of equipment and mix.
- .3 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .4 Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing in adverse weather.
- .5 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.
- .6 Do not place load upon new concrete until authorized by Departmental Representative.

**3.2 CONSTRUCTION**

- .1 Comply with additional requirements of CAN/CSA-A23.1, Clause 4.1.1.5, for concrete exposed to seawater environments.
- .2 Minimum concrete cover over reinforcing steel bars to be 75 mm.
- .3 Place concrete in hot weather to CAN/CSA-A23.1.
- .4 Place concrete in cold weather to CAN/CSA-A23.1.
- .5 Keep concrete surfaces moist continually during protection stage.
- .6 Place, consolidate, finish, cure and protect concrete to CAN/CSA-A23.1.

**PART 3 - EXECUTION**  
**(CONT'D)**

**3.2 CONSTRUCTION**  
**(CONT'D)**

- .7 Do not commence placing concrete until Departmental Representative has inspected and approved forms, foundations, reinforcing steel, joints, conveying, spreading, consolidation and finishing equipment and curing and protective methods.

**3.3 FORMWORK**

- .1 Install and strip formwork to CAN/CSA-A23.1 and Section 03 10 00 – Concrete Forming and Accessories.

**3.4 INSERTS**

- .1 Position and secure inserts, including anchor bolts, in formwork to maintain line and grades.

**3.5 CONTROL JOINTS**

- .1 Construct control joints in locations shown on drawings or directed by Departmental Representative.
- .2 All joints will be centered over a support. Joints will be made in a perfectly straight line.
- .3 Cut control joint when concrete has hardened.
- .4 Fill saw cut with joint sealer as specified.

**3.6 PLACING CONCRETE**

- .1 Place and consolidate concrete to CAN/CSA-A23.1.
- .2 Do not place concrete on or against frozen material.
- .3 Place concrete continuously from joint to joint.
- .4 Place concrete in a uniform heading, normal to the centerline. Limit rate of placing to that which can be finished before beginning of initial set.

**PART 3 - EXECUTION**  
**(CONT'D)**

**3.7 STRIKE OFF AND CONSOLIDATION**

- .1 High speed internal poker vibrators shall be used to consolidate the concrete during placing. Final compaction of the surfaces shall be done by a beam-type vibratory air screed as approved by Departmental Representative. A surcharge of approximately 65 mm of concrete will be maintained at the screed face during consolidation.
- .2 Strike off and consolidation must be completed before excess water bleeds to the surface.
- .3 Ensure that the concrete deck conforms to the elevations and slopes as shown on the drawings so that satisfactory drainage will result.

**3.8 FINISHING**

- .1 Only ACI certified or other pre-approved concrete finishers are to be utilized in finishing all concrete works. All work is to be finished to CAN/CSA-A23.1, and as specified below.
- .2 The surface will be brought to the specified level by means of darbying or bull floating which will be carried out immediately following screeding and must be completed before any bleed water is present on the surface. Surface tolerance to be 8 mm under a 3 meter straight edge.
- .3 Provide slope as shown on the drawings to permit proper drainage of the concrete deck.
- .4 Finish slabs to elevations indicated on drawings.
- .5 Strike off the surface with a straight edge.
- .6 Hand tamp low slump concrete with jitterbug.
- .7 Darby or bull float the surface to smooth and level the concrete.
- .8 Allow bleed water or sheen to disappear.
- .9 Float the surface by means of power and/or hand float where the concrete has hardened enough for a person to leave only slight footprints on the surface.
- .10 Do not bring water and fines to the surface by over floating. Where extra floating is required the floating operation shall be repeated after the time interval necessary for any sheen to disappear and for concrete to set further.

**PART 3 - EXECUTION**  
**(CONT'D)**

**3.8 FINISHING**  
**(CONT'D)**

- .11 Steel trowel the concrete surfaces by means of power and/or hand trowel. Do not leave any hard, smooth, polished or burnished surface area.
- .12 Do not bring water and fines to the surface by over trowelling.
- .13 After slight interval necessary for concrete to further harden, repeat the trowelling operation.
- .14 Lightly broom surface with a soft bristle broom obtaining a fine and even textured finish with a non-slip finish. All brush strokes to be parallel across paving.
- .15 The surface shall be true and accurate to a max. tolerance of 1 mm in 500 mm.

**3.9 PROTECTION AND CURING**

- .1 Cure to CAN/CSA-A23.1.
- .2 Cure concrete by protecting it against loss of moisture, rapid temperature change and mechanical injury for at least seven (7) days after placement. After finishing operations have been completed, the entire surface of the newly placed concrete shall be covered by whatever curing medium is applicable to local conditions and approved by the Departmental Representative. The edges of concrete slabs exposed by removal of forms shall be protected with continuous curing treatment equal to the method selected for curing the slab and curb surfaces. Cure to CAN/CSA-A23.1. Have the equipment needed for adequate curing at hand and ready to install before actual concrete placement begins.
- .3 When air temperature is at or below 5°C or when there is a probability of its falling to that limit within 24 hours of placing (as forecast by the nearest official meteorological office) cold weather protection as per CAN/CSA-A23.1 will be provided and the following:
  - .1 Housing - Protect concrete by a windproof shelter of canvas or other material to allow free circulation of inside air around fresh touch formwork and provide sufficient space for removal of formwork for finishing. Supply approved heating equipment capable of keeping inside air at a constant temperature sufficiently high to maintain concrete at following curing temperatures.
    - .1 For initial three (3) days at a temperature of not less than 15°C nor more than 27°C at surface.
    - .2 Maintain concrete at 10°C for an extra four (4) days plus the initial three (3) days.
    - .3 In addition to the protective housing, the concrete must be cured as outlined in Clause 3.9.2 above.



**PART 3 - EXECUTION**  
**(CONT'D)**

**3.10 TESTING**

- .1 Departmental Representative will appoint a concrete testing company to test all work under this section of specification as per CAN/CSA-A23.1.
- .2 Cost of compressive strength tests shall be paid for by the Departmental Representative.
- .3 Testing company shall issue reports to Departmental Representative on quality of test cylinders.
- .4 Notify Departmental Representative at least seven (7) days prior to start of placing concrete. Provide for testing purposes an adequate quantity of approved test cylinders.
- .5 At least one (1) set of three (3) cylinders each shall be taken from 25 m<sup>3</sup> or fraction thereof of each day's pour, whichever is less. One (1) cylinder shall be tested at seven (7) days and other two (2) tested at 28 days.
- .6 Crate cylinders and deliver to the testing laboratory within 48 hours after casting in accordance with CAN/CSA-A23.1. Contractor will pay for crating and delivery of cylinders to the laboratory.
- .7 If strength tests of test cylinder for any portion of the work falls below the specified compressive strength at 28 days, the Departmental Representative reserves the right to determine the acceptability of the concrete by performing additional field testing as outlined in CAN/CSA-A23.1.
- .8 If concrete does not conform to drawings or specifications, take measures as directed to correct the deficiency. All costs of correctional measures will be at the expense of the Contractor.

## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 61 00 – Common Product Requirements
- .3 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .4 Section 03 30 00 - Cast-in-Place Concrete.

### **1.2 REFERENCES**

- .1 American Society for Testing and Materials International, (ASTM)
  - .1 ASTM A53/A53M-02, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Steamless.
  - .2 ASTM A269-02, Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
  - .3 ASTM A307-07a, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.40-97, Anti-corrosive Structural Steel Alkyd Primer.
  - .2 CAN/CGSB-1.181-92, Ready-Mixed, Organic Zinc-Rich Coating.
- .3 Canadian Standards Association (CSA International)
  - .1 CAN/CSA-G40.20/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel.
  - .2 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
  - .3 CAN/CSA-S16.1-01 (R2007), Limit States Design of Steel Structures.
  - .4 CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
  - .5 CSA W59-03, Welded Steel Construction (Metal Arc Welding).
- .4 The Environmental Choice Program
  - .1 CCD-047a-98, Paints, Surface Coatings.
  - .2 CCD-048-98, Surface Coatings - Recycled Water-borne.

### **1.3 SUBMITTALS**

- .1 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.3 SUBMITTALS**  
**(CONT'D)**

- .1 (cont'd)
- .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's:
  - .1 For finishes, coatings, primers and paints.
- .2 Shop Drawings
  - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

**1.4 QUALITY ASSURANCE**

- .1 Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

**1.5 DELIVERY, STORAGE, AND HANDLING**

- .1 Packing, Shipping, Handling and Unloading:
  - .1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Storage and Protection:
  - .1 Store and leave protective coverings in place until acceptance or as directed by the Departmental Representative. Provide instructions for removal of protective covering.

**1.6 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.6 WASTE MANAGEMENT AND DISPOSAL**  
**(CONT'D)**

- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, corrugated cardboard, packaging material in appropriate on-site for recycling in accordance with Waste Management Plan.
- .4 Divert unused metal materials from landfill to metal recycling facility approved by Departmental Representative.

**1.7 MEASUREMENT FOR PAYMENT**

- .1 All costs associated with this portion of the work will not be measured for payment, but will be included in the lump sum amount of the contract.

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- .1 All metal fabrications and fasteners incorporated into the breakwater construction to be weighed prior to installation with weights provided to the Departmental Representative.
- .2 Steel sections and plates: to CAN/CSA-G40.20/G40.21, Grade 350W, Grade 300W for plates, galvanized
- .3 Steel pipe: to ASTM A53/A53M standard weight epoxy coated and galvanized finish.
- .4 Welding materials: to CSA W59.
- .5 Welding electrodes: to CSA W48 Series.
- .6 Bolts: to ASTM A449, galvanized.
- .7 Nuts: to ASTM A563, DH Heavy Hex, galvanized.
- .8 Washers: Round plate, galvanized.
- .9 Galvanizing: to ASTM A123/A123M – latest edition.

**PART 2 - PRODUCTS**  
**(CONT'D)**

**2.1 MATERIALS**  
**(CONT'D)**

- .10 Zinc Primer: zinc rich, ready mix to CGSB 1-GP-181mt Amdt-Mar-78.

**2.2 FABRICATION**

- .1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .2 Use self-tapping shake-proof flat headed screws on items requiring assembly by screws or as indicated.
- .3 Where possible, fit and shop assemble work, ready for erection.
- .4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.
- .5 All welding shall be carried out in accordance with CSA W59 by a fabricator fully approved under CSA W47-1 latest edition No. 1 and No. 2.

**2.3 FINISHES**

- .1 Galvanizing: hot dipped galvanizing with zinc coating to ASTM A123/A123M, latest edition.

**2.4 SHOP PAINTING**

- .1 Apply one shop coat of primer to metal items, with exception of galvanized, aluminium, or concrete encased items.
- .2 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7 degrees C.
- .3 Clean surfaces to be field welded; do not paint.

### **PART 3 - EXECUTION**

#### **3.1 ERECTION**

- .1 All metal fabrications and fasteners incorporated into the breakwater construction to be weighed prior to installation with weights provided to the Departmental Representative.
- .2 Do welding work in accordance with CSA W59 unless specified otherwise.
- .3 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .4 Provide suitable means of anchorage acceptable to Departmental Representative such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.
- .5 Exposed fastening devices to match finish and be compatible with material through which they pass.
- .6 Provide components for building by other sections in accordance with shop drawings and schedule.
- .7 Make field connections with bolts to CAN/CSA-S16.1, or weld.
- .8 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.
- .9 Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection with primer.
- .10 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

#### **3.2 CLEANING**

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**PART 1 - GENERAL**

**1.1 RELATED SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 61 00 - Common Product Requirements
- .3 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .4 Section 03 30 00 - Cast-in-Place Concrete.

**1.2 REFERENCES**

- .1 American Society for Testing and Materials International, (ASTM).
  - .1 ASTM F2619/F2619M, Standard Specification for high density polyethylene line pipe.
  - .2 ASTM F2206, Standard Specification for fabricated fittings of butt-fused polyethylene.
- .2 American Society of Mechanical Engineers, (ASME).
  - .1 ASME B30.26, Rigging Hardware.
- .3 Federal Specification.
- .4 Canadian Standards Association (CSA International)
  - .1 CAN/CSA-G40.20/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel.
  - .4 CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
  - .5 CSA W59-03, Welded Steel Construction (Metal Arc Welding).

**1.3 SUBMITTALS**

- .1 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's:
    - .1 For finishes, coatings, primers and paints.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.3 SUBMITTALS**  
**(CONT'D)**

- .2 Shop Drawings
  - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

**1.4 QUALITY ASSURANCE**

- .1 Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

**1.5 DELIVERY, STORAGE, AND HANDLING**

- .1 Packing, Shipping, Handling and Unloading:
  - .1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Storage and Protection:
  - .1 Securely store and leave protective coverings in place until final acceptance or as directed by the Departmental Representative. Provide instructions for removal of protective covering.

**1.6 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, corrugated cardboard, packaging material in appropriate on-site for recycling in accordance with Waste Management Plan.
- .4 Divert unused metal materials from landfill to metal recycling facility approved by Departmental Representative.



**PART 1 - GENERAL**  
**(CONT'D)**

**1.7 MEASUREMENT FOR PAYMENT**

- .1 All costs associated with this portion of the work will not be measured for payment, but will be included in the lump sum amount of the contract.

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- .1 All miscellaneous materials incorporated into the breakwater construction to be weighed prior to installation, with weights provided to the Departmental Representative.
- .2 Shackles: Bolt Type shackle, WLL 6.5 tonne, to ASME B30.26, hot dip galvanized, Crosby G-2130A or approved equal.
- .3 Swivels: Jaw End Swivel, WLL 8.16 tonne, to ASME B30.26, hot dip galvanized, Crosby G403 or approved equal.
- .4 Lifting Lugs: Weldable lift lug, loadable from any direction, WLL 5.0 tonne, hot dip galvanized, minimum safety factor 4:1, quenched and tempered, no sharp edges, RUD ABA lifting lug or approved equal. Size/dimension to accommodate connections, as detailed on the drawings.
- .5 Mooring Rope: 44 mm  $\varnothing$  double braided nylon, urethane coated cover, 50 tonne tensile strength, Novagold Novabraid, or approved equal.
- .6 HDPE Pipe: HDPE pipe and fittings to ASTM F2619, D2513, F2206. HDPE to HDPE joints to be thermal butt fusion weld.
- .7 Rubber Tires: Supply and install 635 mm O.D. and 1013 mm O.D. tires as required to completely fill sections of floating breakwater as outlined on the drawings. Tires are to be in competent condition, free from rot, tears and major holes. The Departmental Representative reserves the right to reject any tires he/she deems less than adequate at no cost to Canada.
- .8 Wire Rope: 12.7 mm  $\varnothing$  6 x 19 IWRC (steel core), galvanized, maximum capacity 12 tonne.
- .9 Wire Rope Clips: Forged wire rope clips, to ASME B30.26, hot dip galvanized, 12.7 mm Crosby G-450 (1010131), or approved equal.

**PART 2 - PRODUCTS**  
**(CONT'D)**

**2.1 MATERIALS**  
**(CONT'D)**

- .10 Mooring Chain: 16 mm  $\varnothing$  galvanized chain, breaking load 41 tonne, Crosby Trawlex Mid Link Chain (2784507), or approved equal c/w Crosby Trawlex Auxiliary links KAL 16 (2780280), or approved equal.

**2.2 FINISHES**

- .1 Galvanizing: hot dipped galvanizing with zinc coating to ASTM A123/A123M, latest edition.

**PART 3 - EXECUTION**

**3.1 INSTALLATION**

- .1 All miscellaneous materials incorporated into the breakwater construction to be weighed prior to installation, with weights provided to the Departmental Representative.
- .2 Install materials as detailed on the drawings.

**3.2 CLEANING**

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 01 33 00 – Submittal Procedures.

### **1.2 REFERENCES**

- .1 American Wood-Preservers' Association (AWPA)
  - .1 AWPA M2-01, Standard Inspection of Treated Wood Products.
  - .2 AWPA M4-06, Standard for the Care of Preservative-Treated Wood Products.
- .2 Canadian Standards Association (CSA)
  - .1 CSA O80 Series-97 (R2007), Wood Preservation.
  - .2 CSA O80.201-97, Standard for Hydrocarbon Solvents for Preservatives. This Standard covers hydrocarbon solvents for preparing solutions of preservatives. This is not stand alone specification.
  - .3 CSA O322-02, Procedure for Certification of Pressure-Treated Wood Materials for use in Preserved Wood Foundations.

### **1.3 QUALITY ASSURANCE**

- .1 Testing of products treated with preservative by pressure impregnation will be carried out by the manufacturer's testing laboratory to AWPA M2, and revisions specified in CSA O80 Series, Supplementary Requirements to AWPA M2.
- .2 Inspection and testing of timber materials will be carried out by the manufacturer.

### **1.4 CERTIFICATES AND ASSAY RETENTION RESULTS**

- .1 Submit certificates and assay retention results in accordance with Section 01 33 00 - Submittal Procedures.
- .2 For products treated with preservative by pressure impregnation submit following information certified by authorized signing officer of treatment plant:
  - .1 Information listed in AWPA M2 and revisions specified in CSA O80 Series, Supplementary Requirement to AWPA M2 applicable to specified treatment.
  - .2 Moisture content after drying following treatment with water-borne preservative.
  - .3 Assay retention results representing each treated batch of supplied timber.
  - .4 Acceptable types of paint, stain, and clear finishes that may be used over treated materials to be finished after treatment.

**PART 1 - GENERAL  
(CONT'D)**

**1.5 WASTE MANAGEMENT AND DISPOSAL**

- .1 Do not dispose of preservative treated wood through incineration.
- .2 Do not dispose of preservative treated wood with other materials destined for recycling or re-use.
- .3 Dispose of treated wood, end pieces, wood scraps and sawdust at sanitary landfill approved by Departmental Representative.
- .4 Dispose of unused wood preservative material at official hazardous material collections site approved by Departmental Representative.
- .5 Do not dispose of unused preservative material into sewer system, into streams, lakes, onto ground or in other location where they will pose health or environmental hazard.

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- .1 Preservative: to CSA-O80 Series.
- .2 Solvent: to CSA-O80.201.

**2.2 PRESERVATIVE TREATMENTS**

- .1 Treat to CSA O80, commodity standard O80.18, Table 1 and its referenced standards, with the following minimum assay retentions:

Species	CCA kg/m <sup>3</sup>	ACA kg/m <sup>3</sup>
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Dimension Timber:

- Douglas Fir	24	24
- Western/Eastern Hemlock	24	24
- Hemlock, Douglas Fir (Wheelguard, Wheelguard Blocking)	10	10
- Birch or Maple	Treat to Refusal	

**PART 2 - PRODUCTS**  
**(CONT'D)**

**2.2 PRESERVATIVE TREATMENTS**  
**(CONT'D)**

.1 (cont'd)

Note: Birch or maple must be air dried for six (6) months in weather protected environment or kiln dried.

**2.3 ORDERING TREATED TIMBER**

.1 Ordering of material is to follow the requirements of the contract such that field cutting of treated material is essentially avoided and is used as a last resort and only if authorized by the Departmental Representative.

**PART 3 - EXECUTION**

**3.1 FIELD TREATMENT**

.1 Handle pressure treated material in a manner that will avoid damage which may expose untreated material. Rejection of any damaged material may result and replacement will be at the Contractor's expense.

.2 Fill all bored bolt holes with preservative immediately after boring. Use a pressurized container with hose to apply preservative, or some alternate method acceptable to the Departmental Representative.

.3 Fill all unused bored holes and spike holes with tight fitting treated wooden plugs.

**3.2 CUTTING**

.1 Field cuts, if authorized, are to receive three (3) liberal coats of the applicable preservative applied to dry wood on each application.

**3.3 FIELD QUALITY**

.1 Timbers which contain rot, splits exposing untreated wood, excessive wane, or timbers which cannot be fastened in the work so as to be structurally sound are unacceptable.

**PART 3 - EXECUTION**  
**(CONT'D)**

**3.3 FIELD QUALITY**  
**(CONT'D)**

- .2 The Departmental Representative reserves the right to carry out field testing of treated timber for penetration and retention of preservative. Timber not meeting the requirements of the specification may be rejected for use under the contract.

## **PART 1 - GENERAL**

### **1.1 DESCRIPTION**

- .1 This section specifies requirements for supply and installation of structural timber as follows:
  - .1 Supply and installation of treated dimension timber for the construction of the floating breakwater complete with anti-fouling coating at and below water line.
  - .2 All timber and miscellaneous fasteners incorporated into the breakwater construction to be weighed prior to installation, with weights provided to the Departmental Representative.

### **1.2 RELATED WORK**

- .1 Section 03 30 00 - Cast-in-Place Concrete.
- .2 Section 06 05 73 - Wood Treatment.

### **1.3 REFERENCES**

- .1 American Society for Testing and Materials (ASTM International).
  - .1 ASTM A307-07b, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile.
  - .2 ASTM A123/A123M-09, Zinc (Hot-Dip Galvanized) coatings on Iron and Steel Products.
- .2 American Wood-Preserver's Association (AWPA).
  - .1 AWPA M4-06, Standard for the Care of Preservation - Treated Wood Products.
- .3 Canadian Standards Association (CSA International).
  - .1 CSA B111-1974 (R2003), Wire Nails, Spikes and Staples.
  - .2 CAN/CSA-G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Steel.
  - .2 CAN/CSA-O80 Series-97 (R2007), Wood Preservation.
- .4 Canadian Wood Council.
  - .1 Wood Design Manual.
- .5 National Lumber Grades Authority (NLGA).
  - .1 Standard Grading Rules for Canadian Lumber 2000 edition.

**PART 1 - GENERAL**  
**(CONT'D)**

**1.4 DIMENSIONS**

- .1 Check existing site dimensions and report discrepancies to Departmental Representative before commencing work.

**1.5 PROTECTION**

- .1 Avoid dropping, bruising or breaking of wood fibres.
- .2 Avoid breaking surfaces of treated timber.
- .3 Do not damage surfaces of treated timber by boring holes or driving nails or spikes into them to support temporary material or staging.
- .4 Treat cuts, breaks or abrasions on surfaces of treated timber with three (3) brush coats of preservative to CSA O80.
- .5 Treat bolt holes, cutoffs and field cuts in accordance with CSA O80.

**1.6 DELIVERY AND STORAGE**

- .1 Store timber horizontally, evenly supported and open piled to permit air circulation when stored for prolonged period.
- .2 When handling long timber, provide support at sufficient number of points, properly located to prevent damage due to excessive bending.
- .3 Handle treated timber with hemp, manila or sisal rope slings or other approved means of support that will not damage surface.
- .4 Do not use sharp pointed tools to handle treated timber. Any timber so handled will be rejected and be replaced at Contractor's expense.

**1.7 MEASUREMENT FOR PAYMENT**

- .1 All costs associated with this portion of the work will not be measured for payment, but will be included in the lump sum amount of the contract.

**PART 2 - PRODUCTS**

**2.1 TIMBER MATERIALS**

- .1 Timber: Use timber graded and stamped in accordance with applicable grading rules and standards of associations or agencies approved to grade lumber by Canadian Lumber Standards Administration Board of CSA.



**PART 2 - GENERAL**  
**(CONT'D)**

**2.1 TIMBER MATERIALS**  
**(CONT'D)**

- .2 Species:
  - .1 Hemlock or Douglas Fir (CCA or ACA Treated).
- .3 Grade: No. 1 Structural Grade.
- .4 Grading Authority: NLGA
- .5 Preservative Treatment: Treat to CSA O80, for coastal waters and Section 06 05 73 – Wood Treatment. Timbers will be treated in the lengths required. Unnecessary field cutting will not be permitted.
- .6 Paint Coating: Interlux Micron “CSC” antifouling paint, colour to be chosen by Departmental Representative.

**2.2 MISCELLANEOUS STEEL AND FASTENINGS**

- .1 Miscellaneous Steel Plates: All steel and fastenings to be CSA G40.21, Grade 300W, galvanized.
- .2 Nails and Spikes: to CSA B111.
- .3 Machine Bolts: to ASTM A449. All machine bolts and nuts to be galvanized.
- .4 Drift Bolts: to G40.21 from round stock button head and diamond or wedge point. All drift bolts to be galvanized.
- .5 Washers:
  - .1 Round plate washers: for 22  $\varnothing$  mm machine bolts will be 89 mm diameter by 7.9 mm thick, for 19 mm  $\varnothing$  machine bolts will be 79 mm diameter by 6.4 mm thick, and have a hole diameter of 23.8 mm and 20.6 mm respectively. Washers to conform to G40.21. All washers to be galvanized.
  - .2 Plain Washers: to CSA B19.1, Class 2. All washers to be galvanized.
  - .3 Square washers are not permitted.
- .6 Nuts: to ASTM A563, DH Heavy Hex, galvanized.
- .7 Galvanizing: will conform to ASTM A123/A123M, latest edition.
- .8 Lag Screws: to CSA B34 and be galvanized. Lag screw washers will conform to CSA B19.1.

**PART 2 - GENERAL**  
**(CONT'D)**

**2.2 MISCELLANEOUS STEEL AND FASTENINGS**  
**(CONT'D)**

- .9 Welding: in accordance with CSA Standards. The welders will be qualified to the appropriate classification as stated in CSA W47.1 "Certification of Companies for Fusion Welding of Steel Structures". Conform welding to all appropriate requirements and recommendations of CSA Standard W59 "Welded Steel Construction" (Metal Arc Welding).

**PART 3 - EXECUTION**

**3.1 PREPARATION**

- .1 All timber and miscellaneous fasteners incorporated into the breakwater construction to be weighed prior to installation, with weights provided to the Departmental Representative.
- .2 Install structural timbers to details shown on drawings or as specified.
- .3 Install members true to line, levels and elevations, square and plumb.
- .4 Construct continuous members from pieces of longest practical length.
- .5 Frame, fasten, tie and brace members to provide necessary strength and rigidity.
- .6 Countersink bolts where necessary to provide clearance for other work.

**3.2 PAINTING**

- .1 Paint all surfaces of treated timber at and below water line with two (2) coats of Interlux Micron "CSC" antifouling paint, as directed by the Departmental Representative. Ensure previous coat of primer or paint is dry before second coat is applied.

**3.3 BOLT SIZING**

- .1 Drift Bolts: Drift bolts used in the work will have a length equal to thickness of timbers being fastened less 50 mm unless otherwise specified. Holes for drift bolts will be bored 2 mm smaller diameter than size of steel used and for full length of bolts.

**PART 3 - EXECUTION**  
**(CONT'D)**

**3.3 BOLT SIZING**  
**(CONT'D)**

- .2 Machine Bolts: Machine bolts used in work will have a length equal to thickness of timbers being fastened plus thickness of washers plus 40 mm. Where bolts are countersunk, the length will be as above less depth of countersinking. Machine bolts will be threaded for 64 mm. Holes will be drilled same diameter as bolt.
- .3 Lag Screws: Lag screws used in work will have a length equal to thickness of timbers being fastened less 50 mm and the depth of countersinking. Holes for lag screws to be drilled same diameter as shank for shank portion of screw and to inside thread diameter for threaded portion of screw and for full length. All lag screws will be countersunk, screwed, not driven in place and will have one (1) standard washer under the head.
- .4 Bolting of timbers without properly drilled bolt holes will not be accepted.

**APPENDIX "A"**

**Environmental Screening Documentation**