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Wavebreak Construction
And Installation
Boyne's Cove
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List of Drawings

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DRAWING NO.

TITLE

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Plan of Site and Section

2 of 2

Plan of Wavebreak Section, Elevation and Details

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SPECIFICATION APPROVALS

1. APPROVED BY: _____ DATE: _____

2. TENDER BY: _____ DATE: _____

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Project Particulars
and Measurements

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PART 1 - GENERAL

1.1 DESCRIPTION
OF WORK

- .1 Supply, transportation and installation of three floating wavebreaks and all associated components to the location shown on the plan or as specified by the Departmental Representative.

PART 2 - PRODUCT

MEASUREMENT

2.1 General

- .1 This section details the measurement method to be used for payment purposes. Incidental items covered in the various sections of the specification are to be allowed for in the pricing of each pay item.
- .2 Only items in the bid table will be measured for payment, all other items will be incidental to this contract.

2.2 Measurement
for Payment

- .1 Included:

Division 03: Cast-in-Place Concrete

Supply, transportation and installation of all reinforced concrete anchor blocks at the location shown on the plan will be included in the bid item specified in Section 35 51 24.

Division 05:

The fabrication, supply and installation of all metal parts is considered incidental to this contract. Include costs in bid items.

Division 06:

Costs for the supply of three treated timber floating wavebreaks at the location shown on the plan or as directed by the Departmental Representative, will be included in bid item in Section 35 51 24.

Division 35:

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Project Particulars
and Measurements

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The transportation and installation of three floating wavebreaks will be paid by the unit. Included will be the supply, fabrication, transportation of three (3) floating wavebreaks to the location indicated on the plan, with all necessary connections and specified anchors.

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- 1.1 SCOPE
- .1 The work covered under this project consists of the furnishing of all labour, equipment, hardware and materials for "the supply and installation of 3 timber floating wavebreaks." Also included will be the supply and installation of reinforced concrete anchors with mooring chains. Work area located near the Boyne's Cove Wharf, Charlotte County, N. B., in strict accordance with Specifications and accompanying drawings and subject to all terms and Conditions of the contract.
- .2 Mobilization and Demobilization will be incidental to this contract.
- .2 Only items in the Unit Price Table will be measured for payment. All other work necessary to complete the work will be considered incidental to the project and will not be measured separately for payment.
- 1.2 DESCRIPTION OF WORK
- .1 The work will consist of but will not necessarily be limited to the following:
- .1 Supply, transportation and installation of 3 floating wavebreaks with chains and reinforce concrete anchor blocks as indicated on the drawings.
- 1.3 SITE OF WORK
- .1 Work will be carried out in the waterlot near the Boyne's Cove Wharf, Charlotte County, New Brunswick in the location as shown on the accompanying drawings.
- 1.4 DATUM
- .1 Datum used for this project is Lowest Normal Tides (LNT) and is assumed to be 9.22 metres (deck elevation) below the Benchmark shown on the Plan.
- 1.5 FAMILIARIZATION WITH SITE
- .1 Before submitting a bid, it is recommended that Bidders inspect and examine the site of work and satisfy themselves as to the form and nature of the work, materials, the means of access to the site, and the temporary facilities required for completion of the work. Means of access to the site, severity, exposure and uncertainty of weather, soil conditions, any accommodations they may require, and in general shall

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themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid. No allowance shall be made subsequently in this connection on account of error or negligence to properly observe and determine the conditions that will apply.

- .2 Obtain prior permission from the Departmental Representative before carrying out such site inspection.
- .3 Contractors, bidders or those they invite to site are to review specification Section 01 35 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.
- .4 Bidders are required to wear all appropriate personnel protective equipment and take all precautionary measures necessary to ensure their safety during any pre-tender site visit.
- .5 Contractor shall make own assessment of the site conditions, and difficulties in carrying out the work as specified.

1.6 CODES AND STANDARDS

- .1 Perform work in accordance with the National Building Code of Canada, FCC Standard 373 - Standard for Piers and Wharves (<http://www.hrsdc.gc.ca/en/lp/lo/fp/standards/373.shtml>), and any other 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 LAYOUT OF WORK

- .1 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated or as directed by Departmental Representative.
- .2 Provide devices needed to layout and construct work.

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- .3 Supply such devices as straight edges and templates required to facilitate Departmental Representative's inspection of work.
- .4 Supply stakes and other survey markers required for laying out work.

1.8 WORK SCHEDULE

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

1.9 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

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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.

1.10 MEASUREMENT
RESPONSIBILITIES

- .1 Notify Departmental Representative sufficiently in advance of operations to permit required measurements for payment purposes.

1.11 CONTRACTOR'S
USE OF SITE

- .1 Co-operate with users of existing facilities. Maintain access to the wharf structures during fishing season and consult with the local Harbour Authority for the site access limitations.
- .2 Should interferences occur, take directions from Departmental Representative.
- .3 Construction operations, including storage of materials for this contract, not to interfere with the fishing activity and/or operations at this harbour.
- .4 Responsible for arranging the storage of materials on or off site, and any materials stored at the site which interfere with any of the day to day activities at or near the site will be moved promptly at the Contractor's expense, upon request by Departmental Representative. Obtain and pay for use of additional storage or work areas needed for operations.
- .5 Contractor will take adequate precautions to protect existing structures, and access area.
- .6 Exercise care so as not to obstruct or damage public or private property in the area.
- .7 Do not unreasonably encumber site with materials or equipment.
- .8 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.

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- .9 Comply with all regulations and authorities having jurisdiction over the work, whether on land or on water.
- .10 Remove snow and ice as required maintaining safe access in a manner that does not damage existing structures or interference with operations of others.
- 1.12 PROJECT MEETINGS
- .1 Contractor will arrange project meetings and assume responsibility for setting times and recording minutes and forwarding copies to all parties present at the meetings.
- .2 Project meetings will take place on site of work unless so directed by the Departmental Representative.
- .3 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 or replace all materials or equipment damaged in transit or storage to the satisfaction of Departmental Representative and at no cost to Canada.
- 1.14 ACCEPTANCE
- .1 Prior to the issuance of the Certificate of Substantial Performance, in Company with Departmental Representative; make a check of all work. Correct all discrepancies before final inspection and acceptance.
- 1.15 EXISTING SERVICES
- .1 Where work involves breaking into or connecting to existing services, carry out work at times directed by governing authorities, with minimum of disturbance to site operations.
- .2 Before commencing work, establish location and extent of service lines in area of work and notify Departmental Representative of findings.
- .3 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.

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- .4 Provide temporary services when directed by Departmental Representative 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.
- .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.
- .8 The wharf shall remain in full service to the users during the duration of the construction contract.

1.16 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 to the General Contractor and shall be resolved at no extra cost to Canada.

1.17 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,

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with a continuous reasonable work force, unless otherwise agreed by Departmental Representative.

- .3 Weather conditions, short construction season, delivery challenges and the location of the work site may require the use of longer working days and additional work force to complete the project within the specified completion time.
- .4 Make every effort to ensure that sufficient material and equipment is delivered to site at the earliest possible date after acceptance of bid and replenished as required.

1.18 DOCUMENTS

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

1.19 PERMITS

- .1 In accordance with the General conditions, obtain and pay for building permits, certificates, licenses and other permits as required by Municipal, Provincial, and Federal Authorities.
- .2 Provide appropriate notifications of project to municipal and provincial inspection authorities.
- .3 Obtain compliance certificates as prescribed by legislative and regulatory provisions of municipal, provincial and federal authorities as applicable to the performance of work.

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- .4 Submit to Departmental Representative, copy of application submissions and approval documents received for above referenced authorities.
- .5 Comply with all requirements, recommendations and advice by all regulatory authorities unless otherwise agreed in writing by Departmental Representative. Make requests for such deviations to these requirements sufficiently in advance of related work.
- 1.20 FACILITY SMOKING ENVIRONMENT
- .1 Comply with smoking restrictions.
- 1.21 INTERPRETATION OF DOCUMENTS
- .1 Supplementary to CG1.1 of the General Conditions, the Division 01 sections of the specifications take precedence over technical specifications in other divisions of the specifications.
- 1.22 CUTTING, FITTING AND PATCHING
- .1 Execute cutting, fitting and patching required to make work fit properly.
- .2 Where new work connects with existing and where existing work is altered, cut, patch and make good to match existing work.
- .3 Do not cut, bore, or sleeve load-bearing members.
- .4 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.
- 1.23 LOCATION OF EQUIPMENT
- .1 Location of cleats, equipment, fixtures, power pedestals and outlets, shown or specified shall be considered as approximate. Actual location shall be as required to suit conditions at time of installation and as is reasonable. Obtain approval of Departmental Representative.
- .2 Locate equipment and fixtures to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .3 Inform Departmental Representative when impending installation conflicts with other new or existing components. Follow directives for actual location.

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- .4 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.

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PART 1 - GENERAL

1.1 GENERAL

- .1 The bid item prices are full compensation for the work necessary to complete each item in the Contract in the Form of Tender. The prices bid are complete and separate from other or related bid items.
- .2 In the case of conflict between the instructions for measurement and payment contained in Section 01 22 00 and another Section of the Specifications, the requirements of Section 01 22 00 shall govern.
- .3 No separate payment will be made for:
 - .1 Unauthorized work beyond the limits shown.
 - .2 Field engineering survey and layout of work.
 - .3 Erosion and Sediment Control.
 - .4 Water Management.
 - .5 Dust Control.
 - .6 Temporary Facilities
 - .7 Temporary Barriers and Enclosures
 - .8 Calibrated Weight Scales

1.2 DESCRIPTION
OF WORK

- .1 The tendered price for work includes all items listed within the specification. Price includes all labour, materials, and equipment for complete supply and installation of the work.
- .2 Mobilization/Demobilization including all equipment, temporary facilities, security, maintenance, snow clearing, and cleaning of site and public access roads (as required), securing all necessary regulatory permits, insurance and bonding, establishing health and safety protocol, and the construction, maintenance and decommissioning of all necessary temporary access roads.
- .3 All demolition, material disposal (hazardous and non-hazardous), service disconnection/reconnection, site excavation, construction, repairs and improvements and site restoration and landscaping, as contained in the specifications.

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PART 2 - PRODUCTMEASUREMENT2.1 GENERAL

.1 This section details the measurement method to be used for payment purposes. Incidental items covered in the various sections of the specification are to be allowed for in the pricing of each pay item.

2.2 MEASUREMENT FOR
PAYMENT

.1 Measurement for payment will be as specified in the following section:
Included:

Section 35 51 24 - Floating Wavebreak Installations

.1 Payment for this section will be paid by the unit. Included in the unit bid price is the Construction of the Floating Wavebreaks, miscellaneous Metals specified and indicated on the drawings, reinforced concrete anchors and mooring chains, Inter-Float Connections and any other items, necessary for the complete installation of the Timber Floating Wavebreaks to the locations indicated on the plans and as specified in the various sections of these specifications.

.1 This will include furnishing all equipment necessary for the complete supply, transportation and Installation of the floating Wavebreaks, to the locations indicated on the plan or as indicated by the Departmental Representative.

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Payment Procedures for
Testing Laboratory
Services

Section 01 29 83
Page 1

PART 1 - GENERAL

1.1 SECTION
INCLUDES

- .1 Inspection and testing by inspection 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 laws, ordinances, rules, regulations or 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 tests 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

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Payment Procedures for
Testing Laboratory
Services

Section 01 29 83
Page 2

- exclusive use to store equipment and cure test samples.
- .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.

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Shop Drawings and Other
Submittal Procedures

Section 01 33 00

Page 1

PART 1 - GENERAL

1.1 SECTION

INCLUDES

- .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-ordinate 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

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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.
- .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 revision to submissions which Departmental Representative may require, consistent with Contract Documents and resubmit as directed by Departmental Representative. When resubmitting, notify Departmental Representative in writing of any revisions other than those requested.
- .13 Keep one reviewed copy of each submittal document on site for duration of Work.

1.3 SHOP DRAWINGS
AND PRODUCT DATA

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, product data, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Number of Shop Drawings: submit sufficient copies of shop drawings which are required by the General Contractor and sub-contractors plus 4 copies which will be retained by 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

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Shop Drawings and Other Section 01 33 00
Submittal Procedures Page 3

attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where items or equipment attach or connect to other items or equipment, confirm that all interrelated work have been coordinated, regardless of section 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.

.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 color 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.

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- .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.
 - .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 Public Works and Government Services Canada approves the detail design inherent in the shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting all requirements of the construction and Contract Documents. Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for

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information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of all sub-trades.

1.4 SCHEDULES,
PERMITS AND
CERTIFICATES

- .1 Upon acceptance of bid, submit to Departmental Representative copy of Work Schedule and various other schedules, permits, certification documents and project management plans as specified in other sections of the Specifications.
- .2 Submit copy of permits, notices, compliance Certificates received by Regulatory Agencies having jurisdiction and as applicable to the Work.
- .3 Submission of above documents to be in accordance with Submittal General Requirements procedures specified in this section.

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Special Procedures on Section 01 35 24
Fire Safety Page 1
Requirements

PART 1 - GENERAL

- 1.1 Related Work .1 Section 01 35 29: Health and Safety
- 1.2 References .1 FCC No. 301-June 1982 Standard for Construction Operations.
.2 FCC No. 302-June 1982 Standard for Welding and Cutting.
.3 Above-noted FCC standards, may be viewed at the Regional Fire Protection Services' Office (previously known as the Fire Commissioner of Canada) located at 99 Wyse Road, 8th Floor, Dartmouth, NS; Tel: (902) 426-6053.
- 1.3 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.
.4 Torching operations.
- 1.4 Fire Safety Requirement .1 Implement and follow fire safety measures during Work. Comply with following:
.1 National Fire Code, 1995.
.2 Fire Protection Standards FCC 301 and FCC 302 as issued by the Fire Protection Services of Human Resources Development Canada.
.3 Federal and Provincial Occupational Health and Safety Acts and Regulations.
.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.
- 1.5 Hot Work .1 Obtain Departmental Representative's "Authorization

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Special Procedures on Section 01 35 24
Fire Safety Page 2
Requirements

Authorization

to Proceed" before conducting any form of Hot Work on site.

- .2 To obtain authorization submit to Departmental Representative:
 - .1 Contractor's Hot Work Procedures to be followed on site to ensure fire safety.
 - .2 Description of the type and frequency of Hot Work required.
 - .3 Completed Hot Work Permit.
- .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 and duration of work or;
 - .2 Issue individual Authorization to Proceed for specific items of work by requiring Contractor to fill out individual Hot Work Permit for each hot work event as determined by Departmental Representative.
- .4 Frequency for Hot Work Permit based on:
 - .1 Nature of phasing of work;
 - .2 Risk to facility operations;
 - .3 Quantity of various trades needing to perform hot work on project or;
 - .4 Other situations 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.
- .6 Hot work to be performed inside building can only be done during Facility non-operational periods. Coordinate with Facility Manager through the Departmental Representative in this regard.
- .7 Failure to comply with the established hot work 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 29.

1.6 Hot Work
Procedures

- .1 Develop and implement safety procedures and work practices to be followed during the performance of hot work.

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Special Procedures on Section 01 35 24
Fire Safety Page 3
Requirements

- .2 Procedures to include:
 - .1 Requirement to perform hazard assessment of site and immediate hot work area for each hot work event in accordance with Hazard Assessment and Safety Plan requirements of Section 01 35 29.
 - .2 Use of a Hot Work Permit system for each event when Hot Work event.
 - .3 Permit shall be issued by Contractor's Superintendent granting permission to worker or subcontractor to proceed with hot work.
 - .4 Provision of a designated person(s) to carryout a Fire Safety Watch for a minimum of 60 minutes immediately upon completion of the hot work.
 - .5 Compliance with fire safety codes and standards specified herein and occupational health and safety regulations specified in Section 01 35 29.
 - .3 Generic procedures, if used, must be edited, supplemented with pertinent information and tailored to reflect specific project conditions. Clearly label as being the Hot Work Procedures applicable to this contract.
 - .4 Hot Work Procedures to be in typewritten format, listing step by step procedures and worker instructions, clearly establishing and allocating responsibilities of:
 - .1 Worker(s),
 - .2 Designated person authorized to issue the Hot Work Permit,
 - .3 Fire Safety Watcher,
 - .4 Subcontractors and Contractor.
 - .5 Brief all workers and subcontractors on Hot Work Procedures and Permit system.
- 1.7 Fire Protection and Alarm Systems
- .1 Fire protection and alarm systems shall not be:
 - .1 Obstructed.
 - .2 Shut-off, unless approved by Departmental Representative.
 - .3 Left inactive at the end of a working day or shift.
 - .2 Do not use fire hydrants, standpipes and hose systems for purposes other than fire fighting.
 - .3 Costs incurred, from the fire department, building owner and tenants, resulting from negligently setting off false alarms will be charged to the Contractor in

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the form of financial progress payment reductions and
holdback assessments against the Contract.

1.8 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.

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1.1 RELATED WORK

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

1.2 DEFINITIONS

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

1.3 SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00.
- .2 Submit site-specific Health and Safety Plan prior to commencement of Work.
.1 Submit within 10 work days of notification of Bid Acceptance. Provide 3 copies.
.2 Departmental Representative will review Health and Safety Plan and provide comments.
.3 Revise the Plan as appropriate and resubmit within 5 work days after receipt of comments.
.4 Departmental Representative's review and comments made of the Plan shall not be construed as an endorsement, approval or implied warranty of any kind by Canada and does not reduce Contractor's overall responsibility for Occupational Health and Safety of the Work.

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- .5 Submit revisions and updates made to the Plan during the course of Work.
- .3 Submit name of designated Health & Safety Site Representative and support documentation specified in the Safety Plan.
- .4 Submit building permit, compliance certificates and other permits obtained.
- .5 Submit copy of Letter in Good Standing from Provincial Workers Compensation or other department of labour organization.
 - .1 Submit update of Letter of Good Standing whenever expiration date occurs during the period of Work.
- .6 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .7 Submit copies of incident reports.
- .8 Submit WHMIS MSDS - Material Safety Data Sheets.

1.4 COMPLIANCE
REQUIREMENTS

- .1 Comply with Occupational Health and Safety Act for Province of New Brunswick, and Regulations made pursuant to the Act.
- .2 Comply with Occupational Health and Safety Act for Province of New Brunswick, and General Regulations made pursuant to the Act.
- .3 Comply with Occupational Health and Safety Act for Province of Prince Edward Island, and Occupational Health and Safety Regulations made pursuant to the Act.
- .4 Comply with Canada Labour Code - Part II (entitled Occupational Health and Safety) and the Canada Occupational Health and Safety Regulations (COSH) as well as any other regulations made pursuant to the Act.
 - .1 The Canada Labour Code can be viewed at:
[www.http://laws.justice.gc.ca/en/L-2/](http://laws.justice.gc.ca/en/L-2/)
 - .2 COSH can be viewed at:
[www.http://laws.justice.gc.ca/eng/SOR-86-304/n_e.html](http://laws.justice.gc.ca/eng/SOR-86-304/n_e.html)
 - .3 A copy may be obtained at: Canadian Government Publishing Public Works & Government Services Canada Ottawa, Ontario, K1A 0S9 Tel: (819) 956-4800 (1-800-635-7943) Publication No. L31-85/2000 E or F)

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- .5 Observe construction safety measures of:
 - .1 Part 8 of National Building Code
 - .2 Municipal by-laws and ordinances.
- .6 In case of conflict or discrepancy between above specified requirements, the more stringent shall apply.
- .7 Maintain Workers Compensation Coverage in good standing for duration of Contract. Provide proof of clearance through submission of Letter in Good Standing.
- .8 Medical Surveillance: Where prescribed by legislation or regulation, obtain and maintain worker medical surveillance documentation.

1.5 RESPONSIBILITY

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

1.6 SITE CONTROL
AND ACCESS

- .1 Control the Work and entry points to Work Site. Approve and grant access only to workers and authorized persons. Immediately stop and remove non-authorized persons.
 - .1 Departmental Representative will provide names of those persons authorized by Departmental Representative to enter onto Work Site and will ensure that such authorized persons have the required knowledge and training on Health and Safety pertinent to their reason for being at the site, however, Contractor remains responsible for the health and safety of authorized persons while at the Work Site.
- .2 Isolate Work Site from other areas of the premises by use of appropriate means.
 - .1 Erect fences, hoarding, barricades and temporary lighting as required to effectively delineate the Work

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Site, stop non-authorized entry, and to protect pedestrians and vehicular traffic around and adjacent to the Work and create a safe environment. See Section 01 50 00 for minimum acceptable requirements.

.2 Post signage at entry points and other strategic locations indicating restricted access and conditions for access.

.3 Use professionally made signs with bilingual message in the 2 official languages or international known graphic symbols.

.3 Provide safety orientation session to persons granted access to Work Site. Advise of hazards and safety rules to be observed while on site.

.4 Ensure persons granted site access wear appropriate PPE. Supply PPE to inspection authorities who require access to conduct tests or perform inspections.

.5 Secure Work Site against entry when inactive or unoccupied and to protect persons against harm. Provide security guard where adequate protection cannot be achieved by other means.

1.7 PROTECTION

.1 Give precedence to safety and health of persons and protection of environment over cost and schedule considerations for Work.

.2 Should unforeseen or peculiar safety related hazard or condition become evident during performance of Work, immediately take measures to rectify situation and prevent damage or harm. Advise Departmental Representative verbally and in writing.

1.8 FILING OF
NOTICE

.1 File Notice of Project with pertinent provincial health and safety authorities prior to beginning of Work.

.1 Departmental Representative will assist in locating address if needed.

1.9 PERMITS

.1 Post permits, licenses and compliance certificates, specified in section 01 10 10, at Work Site.

.2 Where a particular permit or compliance certificate cannot be obtained, notify Departmental Representative in writing and obtain approval to proceed before

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carrying out applicable portion of work.

1.10 HAZARD
ASSESSMENTS

- .1 Perform site specific health and safety hazard assessment of the Work and its site.
- .2 Carryout initial assessment prior to commencement of Work with further assessments as needed during progress of work, including when new trades and subcontractors arrive on site.
- .3 Record results and address in Health and Safety Plan.
- .4 Keep documentation on site for entire duration of the Work.

1.11 PROJECT/SITE
CONDITIONS

- .1 Following are potential health, environmental and safety hazards at the site for which Work may involve contact with:
 - .1 Known latent site and environmental conditions:
 - .1 Working near watercourse.
 - .2 Working with tides.
 - .3 Uneven work surfaces.
 - .4 Adverse weather conditions.
 - .5 Working with heights.
 - .2 Facility on-going operations:
 - .1 The Contractor will co-operate with users of existing facilities. Maintain access to the existing wharf structures during fishing season and consult with the Departmental Representative for site access limitations.
 - .2 Should interference occur, take directions from Departmental Representative.
 - .3 Do not unreasonably encumber site with materials.
 - .4 Move stored products or equipment which interfere with operations.
 - .5 Comply with all regulations and authorities having jurisdiction over the work, whether on land or on water.
 - .6 Contractor will note that fishing activity in the harbour includes fishing boats, moorings, etc.
- .2 Above items shall not be construed as being complete and inclusive of potential health and safety hazards encountered during Work.

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- .3 Include above items in the hazard assessment of the Work.
- .4 MSDS Data sheets of pertinent hazardous and controlled products stored on site can be obtained from Departmental Representative.

1.12 MEETINGS

- .1 Attend pre-construction health and safety meeting, convened and chaired by Departmental Representative, prior to commencement of Work, at time, date and location determined by Departmental Representative. Ensure attendance of:
 - .1 Superintendent of Work
 - .2 Designated Health & Safety Site Representative
 - .3 Subcontractors
- .2 Conduct regularly scheduled tool box and safety meetings during the Work in conformance with Occupational Health and Safety regulations.
- .3 Keep documents on site.

1.13 HEALTH AND SAFETY PLAN

- .1 Prior to commencement of Work, develop written Health and Safety Plan specific to the Work. Implement, maintain, and enforce Plan for entire duration of Work and until final demobilization from site.
- .2 Health and Safety Plan shall include the following components:
 - .1 List of health risks and safety hazards identified by hazard assessment.
 - .2 Control measures used to mitigate risks and hazards identified.
 - .3 On-site Contingency and Emergency Response Plan as specified below.
 - .4 On-site Communication Plan as specified below.
 - .5 Name of Contractor's designated Health & Safety Site Representative and information showing proof of his/her competence and reporting relationship in Contractor's company.
 - .6 Names, competence and reporting relationship of other supervisory personnel used in the Work for occupational health and safety purposes.
- .3 On-site Contingency and Emergency Response Plan shall include:
 - .1 Operational procedures, evacuation measures and communication process to be implemented in the event

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of an emergency.

.2 Evacuation Plan: site and floor plan layouts showing escape routes, marshalling areas. Details on alarm notification methods, fire drills, location of firefighting equipment and other related data.

.3 Name, duties and responsibilities of persons designated as Emergency Warden(s) and deputies.

.4 Emergency Contacts: name and telephone number of officials from:

.1 General Contractor and subcontractors.

.2 Pertinent Federal and Provincial Departments and Authorities having jurisdiction.

.3 Local emergency resource organizations.

.5 Harmonize Plan with Facility's Emergency Response and Evacuation Plan. Departmental Representative will provide pertinent data including name of PWGSC and Facility Management contacts.

.4 On-site Communication Plan:

.1 Procedures for sharing of work related safety information to workers and subcontractors, including emergency and evacuation measures.

.2 List of critical work activities to be communicated with Facility Manager which have a risk of endangering health and safety of Facility users.

.5 Address all activities of the Work including those of subcontractors.

.6 Review Health and Safety Plan regularly during the Work. Update as conditions warrant to address emerging risks and hazards, such as whenever new trade or subcontractor arrive at Work Site.

.7 Departmental Representative will respond in writing, where deficiencies or concerns are noted and may request re-submission of the Plan with correction of deficiencies or concerns.

.8 Post copy of the Plan, and updates, prominently on Work Site.

1.14 SAFETY
SUPERVISION

.1 Employ Health & Safety Site Representative responsible for daily supervision of health and safety of the Work.

.2 Health & Safety Site Representative may be the Superintendent of the Work or other person designated by Contractor and shall be assigned the responsibility and authority to:

.1 Implement, monitor and enforce daily compliance

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with health and safety requirements of the Work
.2 Monitor and enforce Contractor's site-specific Health and Safety Plan.
.3 Conduct site safety orientation session to persons granted access to Work Site.
.4 Ensure that persons allowed site access are knowledgeable and trained in health and safety pertinent to their activities at the site or are escorted by a competent person while on the Work Site.
.5 Stop the Work as deemed necessary for reasons of health and safety.

- .3 Health & Safety Site Representative must:
 - .1 Be qualified and competent person in occupational health and safety.
 - .2 Have site-related working experience specific to activities of the Work.
 - .3 Be on Work Site at all times during execution of the Work.
- .4 All supervisory personnel assigned to the Work shall also be competent persons.
- .5 Inspections:
 - .1 Conduct regularly scheduled safety inspections of the Work on a minimum bi-weekly basis. Record deficiencies and remedial action taken.
 - .2 Conduct Formal Inspections on a minimum monthly basis. Use standardized safety inspection forms. Distribute to subcontractors.
 - .3 Follow-up and ensure corrective measures are taken.
- .6 Cooperate with Facility's Occupational Health and Safety representative should one be designated by Departmental Representative.
- .7 Keep inspection reports and supervision related documentation on site.

1.15 TRAINING

- .1 Use only skilled workers on Work Site who are effectively trained in occupational health and safety procedures and practices pertinent to their assigned task.
- .2 Maintain employee records and evidence of training received. Make data available to Departmental Representative upon request.

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- .3 When unforeseen or peculiar safety-related hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Departmental Representative verbally and in writing.
- 1.16 MINIMUM SITE SAFETY RULES
- .1 Notwithstanding requirement to abide by federal and provincial health and safety regulations; ensure the following minimum safety rules are obeyed by persons granted access to Work Site:
- .1 Wear appropriate PPE pertinent to the Work or assigned task; minimum being hard hat, safety footwear, safety glasses and hearing protection.
 - .2 Immediately report unsafe condition at site, near-miss accident, injury and damage.
 - .3 Maintain site and storage areas in a tidy condition free of hazards causing injury.
 - .4 Obey warning signs and safety tags.
- .2 Brief persons of disciplinary protocols to be taken for non compliance. Post rules on site.
- 1.17 CORRECTION OF NON-COMPLIANCE
- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Departmental Representative will stop Work if non-compliance of health and safety regulations is not corrected in a timely manner.
- 1.18 INCIDENT REPORTING
- .1 Investigate and report the following incidents to Departmental Representative:
- .1 Incidents requiring notification to Provincial Department of Occupational Safety and Health, Workers Compensation Board or to other regulatory Agency.
 - .2 Medical aid injuries.
 - .3 Property damage in excess of \$10,000.00,
 - .4 Interruptions to Facility operations resulting in an operational lost to a Federal department in excess of \$5000.00.
- .2 Submit report in writing.

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1.19 HAZARDOUS
PRODUCTS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS).
- .2 Keep MSDS data sheets for all products delivered to site.
 - .1 Post on site.
 - .2 Submit copy to Departmental Representative.
- .3 For interior work in an occupied Facility, post additional copy in one or more publicly accessible locations.

1.20 BLASTING

- .1 Blasting or other use of explosives is not permitted on site without prior receipt of written permission and instructions from Departmental Representative.
- .2 Do blasting operations in accordance with section.

1.21 POWDER ACTUATED
DEVICES

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

1.22 CONFINED
SPACES

- .1 Abide by occupational health and safety regulations regarding work in confined spaces.
- .2 Obtain an Entry Permit in accordance with Part XI of the Canada Occupational Health and Safety Regulations for entry into an existing identified confined space located at the Facility or premises of Work.
 - .1 Obtain permit from Facility Manager
 - .2 Keep copy of permit issued.
- .3 Safety for Inspectors:
 - .1 Provide PPE and training to Departmental Representative and other persons who require entry into confined space to perform inspections.
 - .2 Be responsible for efficacy of equipment and safety of persons during their entry and occupancy in the confined space.

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1.23 SITE RECORDS

- .1 Maintain on Work Site copy of safety related documentation and reports stipulated to be produced in compliance with Acts and Regulations of authorities having jurisdiction and of those documents specified herein.
- .2 Upon request, make available to Departmental Representative or authorized Safety Officer for inspection.

1.24 POSTING OF
DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on Work Site in accordance with Acts and Regulations of Province having jurisdiction.
- .2 Post other documents as specified herein, including:
 - .1 Site specific Health and Safety Plan
 - .2 WHMIS data sheets
 - .3 Fire and Safety Requirements
 - .4 Special Procedures on Lockout Requirements

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1.1 DEFINITIONS

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

1.2 FIRES

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

1.3 DISPOSAL OF
WASTES AND
HAZARDOUS
MATERIALS

- .1 Do not bury rubbish and waste materials on site. Dispose at approved landfill sites as specified in Section 01 74 19.
- .2 Do not dispose of hazardous waste or volatile materials, such as mineral spirits, paints, thinners, oil or fuel into waterways, storm or sanitary sewers or waste landfill sites.
- .3 Store, handle and dispose of hazardous materials and hazardous waste in accordance with applicable federal and provincial laws, regulations, codes and guidelines.
- .4 Dispose of construction waste materials and demolition debris, resulting from work, at approved landfill sites only. Carry out such disposal in strict accordance with provincial and municipal rules and regulations. Separate out and prevent improper disposal of items banned from landfills.
- .5 Establish 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 waste categories in order to maximize recycling abilities of various materials and avoid disposal of debris at landfill site(s) in a "mixed state". Where recycling firms, specializing in recycling of specific materials exist, transport such materials to the recycling facility and avoid disposal at landfill sites.
- .6 Communicate with landfill operator prior to commencement of work, to determine what specific

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construction, demolition and renovation waste materials have been banned from disposal at the landfill and at transfer stations.

1.4 DRAINAGE

- .1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.
- .2 Do not pump water containing suspended materials into waterways, sewer or drainage systems.
- .3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with governing regulations and requirements.
- .4 Pumped water must meet applicable federal, provincial, and municipal standards before it can be discharged to a surface water body. If regulatory guidelines exceedences 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.

1.5 PERMITS

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

1.6 WORK ADJACENT
TO WATERWAYS

- .1 Do not operate construction equipment in waterways.
- .2 Do not use waterway beds for borrow material.
- .3 Do not dump excavated fill, waste material or debris in waterways.
- .4 At borrow sites, design and construct temporary crossings to minimize erosion to waterways in strict conformance with provincial and federal environmental

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regulations.

- .5 Do not skid logs or construction materials across waterways.
- .6 Avoid indicated spawning beds when constructing temporary crossings of waterways.
- .7 Do not blast under water or 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.

1.7 POLLUTION CONTROL

- .1 Maintain temporary erosion and pollution control features installed under this contract.
- .2 Control emissions from equipment and plant to local authorities emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads and around entire construction site.
- .5 Maintain inventory of hazardous materials and hazardous waste stored on site. List items by product name, quantity and date when storage began.
- .6 Have emergency spill response equipment and rapid clean-up kit, appropriate to work, at site. Locate adjacent to work and where hazardous materials are stored. Provide personal protective equipment as required for clean-up.
- .7 Report, to Federal and Provincial Department of 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.
- .8 Provide a floating debris containment boom whenever any of the Contractors methods of work allow for the potential of floating debris.

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1.8 WILDLIFE
PROTECTION

- .1 Should nests of migratory birds in wetlands be encountered during work, immediately notify Departmental Representative for directives to be followed.
 - .1 Do not disturb nest site and neighboring 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.

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1.1 INSPECTION

- .1 Give timely notice requesting inspection of Work designated for special tests, inspections or approvals by Departmental Representative or by inspection authorities having jurisdiction.
- .2 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.
- .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.
- .4 Pay costs to uncover and make good work disturbed by inspections and tests.

1.2 TESTING

- .1 Tests on materials, equipment and building systems as specified in various sections of the Specifications is the responsibility of the Contractor except where stipulated otherwise.
 - .1 Provide all necessary instruments, equipment and qualified personnel to perform tests.
- .2 At completion of tests, turn over 2 sets of fully documented tests reports to the Departmental Representative. Submit in accordance with Section 01 33 00.
 - .1 Obtain additional copies for inclusion of a complete set in each of the maintenance manuals specified in Section 01 78 00.
- .3 Unspecified tests may also be made by Departmental Representative, at the discretion of the Departmental Representative. The costs of these tests will be paid for by the Departmental Representative.
- .4 Where tests or inspections reveal work not in accordance with contract requirements, Contractor shall pay costs for additional tests and inspections

incurred by Departmental Representative as required to verify acceptability of corrected work.

1.3 INDEPENDENT
INSPECTION AGENCIES

- .1 Departmental Representative may 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 mechanical and electrical equipment and other building systems.
 - .4 Performance verification tests before building commissioning procedures commences.
 - .5 Mill tests and certificates of compliance.
 - .6 Tests as specified within various sections designated to be carried out by Contractor under the supervision of Departmental Representative.
 - .7 Additional tests as specified in Clause 1.3.4 above.
- .2 Provide sufficient advance notice to Departmental Representative of time when the Work will be ready for testing by designated Testing Agency in order for Departmental Representative to make attendance arrangements with such Agency. When directed by Departmental Representative notify the Agency directly.
- .3 When specified or directed, submit Representative samples of materials, in required quantities, to Testing Agency for testing purposes. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.
- .4 Provide labour and facilities to obtain, handle and deliver samples.
- .5 Provide sufficient space on site for Testing Agency's exclusive use to store equipment and cure test samples.
- .6 Employment of Independent Inspection and Testing Agencies by Departmental Representative does not relax responsibility to perform Work in accordance with

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Contract Documents.

1.4 ACCESS TO WORK

- .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 Furnish labour and facility to provide access to the work being inspected and tested.
- .3 Co-operate to facilitate such inspections and tests.

1.5 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 new and existing construction and finishes resulting from removal or replacement of defective work.

1.6 MOCK-UPS

- .1 Prepare mock-ups of certain work as specified in various sections of the Specifications. 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

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in preparing a schedule fixing dates for preparation.

- .6 Dismantle and remove mock-up when directed by Departmental Representative, unless approval is given for mock-up to remain as part of the Work.

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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 Contractors' 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°C inside temperature at -20°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 m² of glass and arranged to provide at least 0.5 m² of screened opening. The door will be fitted with a lockset and 2 keys.
- .4 The office will be equipped with a drafting chair and a 900 mm x 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 the Departmental Representative's Office for Site Representative's exclusive use. Long distance calls or faxes placed on this phone by the Departmental Representative or the Site Representative will be paid by the Departmental Representative.
- .8 Contractor may, on approval of Departmental Representative, provide cellular or mobile phone. If

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approval to use cellular or mobile phone is granted, be responsible for all services, airtime, 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 CONSTRUCTION SIGN AND NOTICES

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

1.8 REMOVAL OF TEMPORARY

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

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FACILITIES

1.9 MEASUREMENT FOR
PAYMENT

- .1 No measurement for payment will be made under this section, it will be considered incidental to this contract.

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Temporary Barriers
and Enclosures

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PART 1 - GENERAL

1.1 SECTION
INCLUDES

- .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 GUARD RAILS
AND BARRICADES

- .1 Provide secure, rigid guard rails and barricades around open excavations.

1.4 ACCESS TO SITE

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

1.5 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.

1.6 FIRE ROUTES

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

1.7 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.

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Common Product
Requirements

Section 01 61 00
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1.1 GENERAL

- .1 Use new material and equipment unless otherwise specified.
- .2 Within 7 days of written request by Departmental Representative, submit following information for any materials and products proposed for supply:
 - .1 name and address of manufacturer;
 - .2 trade name, model and catalogue number;
 - .3 performance, descriptive and test data;
 - .4 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 rest solely with the Departmental Representative in accordance with the General Conditions.

1.3 ACCEPTABLE
MATERIALS AND
ALTERNATIVES

- .1 Where materials are specified by trade names, trade marks or manufacturers, when so listed in the various sections of the Specification or added into the Contract Documents by addendum, select one of the names listed for use on project.
- .2 In accordance with Clause 15 of the General

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Common Product
Requirements

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Instructions to Bidders, Document No. R2710T, submission of alternative materials to those trade names or manufacturers listed in the Contract Documents as Acceptable Materials must be done during the bidding period following procedures indicated therein.

- .3 Note that Document R2710T is incorporated by reference into, and forms part of the Bid and Contract Documents.

1.4 MANUFACTURER'S
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 1.1.2.6 above.

1.6 WORKMANSHIP

- .1 Ensure quality of work is of highest standard, executed by workers experienced and 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 subcontractors. See section 01 14 10 in this regard.
- .5 Coordinate placement of openings, sleeves and accessories.

1.7 FASTENINGS -
GENERAL

- .1 Provide metal fastenings and accessories in same texture, color and finish as base metal in which they

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Common Product
Requirements

Section 01 61 00
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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 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 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. Provide same degree of protection to materials supplied by Canada.
- .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.

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Requirements

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- .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, cleanup and dispose in an environmentally responsible manner.

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PART 1 - GENERAL

1.1 GENERAL

- .1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
- .2 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .3 Prevent 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 accumulations of waste material and debris. Clean areas on a daily basis.
- .2 Provide on-site garbage containers for collection of waste materials and debris.
- .3 Remove waste materials, and debris from site on a daily basis.

1.4 FINAL CLEANING

- .1 In preparation for acceptance of the Work 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.

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PART 1 - GENERAL

1.1 RELATED
SECTIONS

- .1 Section 03 30 00 - Cast-in-Place Concrete.

1.2 DISPOSAL
OF WASTE

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

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- .12 Dispose of unused preservative material at an official hazardous material collections site. Do not dispose of unused preservative material into the sewer system, streams, lakes, on ground or in any other location where they will pose a health or environmental hazard.
- .13 Burying of rubbish and waste materials is prohibited.
- .14 All waste material not designated for recycle to be disposed of at an approved waste disposal site in accordance with appropriate environmental guidelines.

1.3 STORAGE AND
HANDLING OF WASTE

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

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 - EXECUTION

3.1 APPLICATION

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

3.2 CLEANING

- .1 Remove tools and waste materials on completion of work and leave work area in clean and orderly condition.
- .2 Clean-up work area as work progresses.

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.3 Source separate materials to be reused or recycled into specified sort areas.

3.3 DIVERSION OF MATERIALS

.1 Separate materials from general waste and stockpile in separate piles or containers, to approval of Departmental Representative, and consistent with applicable fire regulations. Mark containers or stockpile areas. Provide instruction on disposal practices.

.2 On-site sale of salvaged, recovered, reusable, or recyclable materials is not permitted.

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PART 1 - GENERAL

1.1 SECTION
INCLUDES

- .1 Administrative procedures preceding inspection and acceptance of Work by Departmental Representative.

1.2 PROJECT RECORD
DOCUMENTS

- .1 Contractor's Inspection: Coordinate and perform, in concert with subcontractors, an inspection and check of all Work. Identify and correct deficiencies, defects, repairs and perform outstanding items as required to complete the Work in conformance with Contract Drawings Documents.
 - .1 Notify Departmental Representative in writing when deficiencies from Contractor's inspection have been rectified and that Work is deemed to be completed and ready for Departmental Representative's inspection of the completed work.
 - .1 Submit color photographs of Work; field drawings that supplies sufficient tie points to locate footprint of backfilled notification to the Departmental Representative.
 - .2 Departmental Representative's Inspection: Accompany Departmental Representative during all Substantial and final inspections of the Work.
 - .1 Address defects, faults and outstanding items Of work identified by such inspections.
 - .2 Advise Departmental Representative when all Deficiencies identified have been rectified. Submit color photographs of rectified work Along with this written notification.
- .3 Note that Departmental Representative will no issue a Certificate of Substantial Performance of the Work until such time that the Contractor performs following work and turns over the specified documents:
 - .1 Project record as-built field sketches;
 - .2 Final Operations and Maintenance manuals;
 - .3 Maintenance materials, parts and tools;
 - .4 Compliance certificates from applicable authorities;
 - .5 Reports resulting from designated tests;
 - .6 Demonstration and training complete with user manuals;
 - .7 Manufacturer's Guarantee Certificates;
 - .8 Testing, adjusting and balancing of equipment

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- and systems complete with submission of tests reports;
 - .9 Commissioning of equipment and systems specified;
 - .10 Color photographs depicting all aspects of work completed;
 - .11 Material Removal log, and Waste Manifests.
- .4 Correct all discrepancies before Departmental Representative will issue the Certificate of Completion.

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PART 1 - GENERAL

1.1 SECTION
INCLUDES

- .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 white print sets of contract drawings and two copies of Specifications Manual specifically for "as-built" purposes.
- .2 Maintain at site one 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 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.

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.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.

- .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 2 full sets of all reviewed shop drawings.

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PART 1 - GENERAL

1.1 Related Sections

- .1 Section 01 74 19 - Construction/Demolition Waste Management And Disposal.
- .2 Section 03 10 00 - Concrete Forming and Accessories
- .3 Section 03 20 00 - Concrete Reinforcing
- .4 Section 03 30 00 - Cast-in-Place Concrete
- .5 Section 05 50 00 - Miscellaneous Metals

1.2 References

- .1 Canadian Standards Association (CSA)
 - .1 CAN/CSA-A23.1, Concrete Materials and Methods of Concrete Construction.
 - .2 CAN/CSA-A23.2-00, Methods of Test for Concrete.
 - .3 CAN/CSA-A3000-98-A5-98, Portland Cement.
 - .4 CAN/CSA-G30.18-M92 (R1998), Billet-Steel Bars for Concrete Reinforcement.

1.3 Submittals

- .1 Shop Drawings
 - .1 Submit placing drawings prepared in accordance with plans to clearly show size, shape, location and all necessary details of reinforcing.
 - .2 Submit drawings showing formwork and falsework design to: CAN/CSA-A23.1.
 - .3 Drawings to bear stamp and signature of qualified professional engineer registered or licensed in Province of New Brunswick, Canada.

1.4 Waste Management and Disposal

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management And Disposals.
- .2 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.
- .3 Place materials defined as hazardous or toxic in designated containers.
- .4 Ensure emptied containers are sealed and stored safely.

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- .5 Use trigger operated spray nozzles for water hoses.
- .6 Designate cleaning area for tools to limit water use and runoff.

PART 2 - PRODUCTS

2.1 Materials

- .1 Portland cement: to CAN/CSA-A3000-A5, Type 10.
- .2 Reinforcing bars: to CAN/CSA-G30.18, Grade 400.
- .3 Water: to CAN/CSA-A23.1
- .4 Aggregates: to CAN/CSA-A23.1. Coarse aggregate to be normal density.
- .5 Air Entraining Admixture: to ASTM C 260.
- .6 Chemical admixtures: to ASTM C 494. Departmental Representative to approve accelerating or set retarding admixtures during cold weather placing.
- .7 Concrete Retarders: to ASTM C 494, low VOC, solvent free. Do not allow moisture of any kind to come in contact with the retarder film
- .8 Joint sealer/filler: grey, to CAN/CGSB-19.24, Type 1, Class B.
- .9 Sealer: proprietary poly-siloxane resin blend.
- .10 Other concrete materials: to CAN/CSA-A23.1.

2.2 Mixes

- .1 Proportion concrete in accordance with CAN/CSA-A23.1.
- .2 Minimum compressive strength at 35 MPa as specified by Departmental Representative.
- .3 Nominal maximum size of coarse aggregate: to CAN/CSA-A23.1.
- .4 Slump: to CAN/CSA-A23.1.
- .5 Air content: concrete to contain purposely entrained air in accordance with CAN/CSA-A23.1, Table 10.
- .6 Admixtures: to CAN/CSA-A23.1.

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- .7 Do not use calcium chloride or compounds containing calcium chloride.
- .8 Weigh aggregates, cement, water and admixtures separately when batching. Inspect and test scales for accuracy as directed. Accuracy to be such that successive quantities can be measured to within one percent of desired amounts. Tests certificates to be submitted to Departmental Representative upon request.
- .9 Provide certification that plant, equipment and all materials to be used in concrete comply with the requirements of CSA A23.1-00.
- .10 Provide certification from independent testing and inspection company that mix proportions selected will produce concrete specified quality and can be effectively placed and finished for all work under this contract.

PART 3 - EXECUTION

3.1 Preparation

- .1 Obtain Departmental Representative's approval before placing concrete. Provide 24 hours notice to placing concrete.
- .2 Pumping of concrete is permitted only after approval of equipment mixture.

3.2 Construction

- .1 Do concrete work in accordance with CAN/CSA-A23.1.

3.3 Inserts

- .1 Cast in sleeves, ties, slots, anchors, reinforcement, frames, conduit, bolts, waterstops, joint fillers and other inserts required to be built-in. Sleeves and openings greater than 100 mm x 100 mm not indicated, must be approved by Departmental Representative.

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|----------------------------------|----|--|
| <u>3.4 Curing</u> | .1 | Cure and protect concrete in accordance with CAN/CSA-A23.1. |
| <u>3.5 Sealing</u> | .1 | Following curing, apply poly-siloxane resin blend sealer at 4 m ² /L. |
| <u>3.6 Field Quality Control</u> | .1 | Concrete testing: to CAN/CSA-A23.2 by testing laboratory designated and paid for by Departmental Representative. |

PART 1 - GENERAL

- 1.1 Measurement Procedures .1 No measurement will be made under this Section. Include costs in items of work for which concrete formwork is required.
- 1.2 References .1 Canadian Standards Association (CSA)
.1 CAN/CSA-A23.1-94, Concrete Materials and Methods of Concrete Construction.
.2 CAN/CSA-S269.3-M92, 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, ties, and locations of temporary embedded parts. 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 Each shop drawing submission shall bear stamp and signature of qualified professional engineer registered or licensed in Province of New Brunswick, Canada.
- 1.4 Waste Management and Disposal .1 Separate and recycle waste materials in accordance with Section 01 74 19 - 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

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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 For concrete, use wood and wood product formwork materials to CAN/CSA-086.1.
- .2 Form ties:
 - .1 For concrete not designated 'Architectural', use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm dia. in concrete surface.
- .3 Form release agent: non-toxic.
- .4 Form stripping agent: colourless mineral oil, non-toxic.
- .5 Falsework materials: to CSA-S269.1.

PART 3 - EXECUTION

3.1 Fabrication and Erection

- .1 Verify lines, levels and centres 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 and COFI Exterior Plywood for Concrete Formwork.
- .5 Do not place shores and mud sills on frozen ground.

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- .6 Provide site drainage to prevent washout of soil supporting mud sills and shores.
 - .7 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.
 - .8 Align form joints and make watertight. Keep form joints to minimum.
 - .9 Use 25 mm chamfer strips on external corners and/or 25 mm fillets at interior corners, joints, unless specified otherwise.
 - .10 Form chases, slots, openings, recesses, expansion and control joints as indicated.
 - .11 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.
- 3.2 Removal and
Reshoring
- .1 Leave formwork in place for following minimum periods of time after placing concrete.
 - .1 Five days for slabs, decks and other structural members.
 - .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.

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PART 1 - GENERAL

- 1.1 DESCRIPTION .1 This section specifies the requirements for the supply and installation of reinforcing steel for structural concrete.
- 1.2 RELATED WORK .1 Cast-In-Place Concrete: Section 03 30 00
- 1.3 MEASUREMENT FOR PAYMENT .1 No measurement will be made under this section. Include costs in items of concrete work for which reinforcement is required.
- 1.4 REFERENCE STANDARDS .1 Do concrete reinforcement work in accordance with CAN3-A23.1-M94 except where specified otherwise. Welding of reinforcement is not permitted.
- 1.5 SOURCE SAMPLING .1 Upon request, provide Departmental Representative with certified copy of mill test of steel supplied showing physical and chemical analysis.
- 1.6 SHOP DRAWINGS .1 Submit shop drawings in accordance with Section 01 33 00.
- .2 Clearly indicate bar sizes, spacing, location and quantities of reinforcement, chairs, spacers and hangers with identifying code marks to permit correct placement without reference to structural drawings; to ACI Manual of Standard Practice for Detailing Reinforced Concrete Structures.
- .3 Detail placement of reinforcing where special conditions occur.

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- .4 Design and detail lap lengths and bar development lengths to CAN3-A23.3-M90, unless otherwise specified on drawings.
- .5 Unless otherwise noted on design drawings, all reinforcing laps shall be detailed as Class C tension lap splices.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Reinforcing steel: to CSA G30-18-M92 billet steel grade 400, deformed bars.
- .2 Wire Ties: to CSA G30.3-1972 (R1979) plain, cold drawn annealed steel wire.
- .3 Supports: to CAN3-A23.1-M90.

2.2 FABRICATION

- .1 Fabricate reinforcing steel within following tolerances:
 - .1 Sheared length: plus or minus 25 mm.
 - .2 Ties: plus or minus 12 mm.
 - .3 Other bends: plus or minus 25 mm.
- .2 Ship bundles of bar reinforcement, clearly identified in accordance with bar list.

PART 3 - EXECUTION

3.1 FIELD BENDING

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

3.2 PLACING

- .1 Accurately place reinforcing steel in positions indicated and hold firmly during placing, compacting and setting of concrete.
- .2 Reinforcement shall be placed so that it is completely

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isolated from embedded parts.

- .3 Tie reinforcement where spacing in direction is:
 - .1 Less than 300 mm: - tie at alternate intersections.
 - .2 300 mm or more: - tie at each intersection.
- .4 Keep reinforcement 75 mm back from edges unless otherwise noted on Plan.

3.3 CLEANING

- .1 Clean reinforcing before placing concrete.

3.4 INSPECTION

- .1 Do not place concrete until Departmental Representative has inspected and approved reinforcement work in place.

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PART 1 - GENERAL

1.1 RELATED
SECTIONS

- .1 Concrete General: Section 03 05 10
- .2 Concrete Forming and Accessories: Section 03 10 00
- .3 Concrete Reinforcing: Section 03 20 00
- .4 Miscellaneous Metals: Section 05 50 00

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A 185-05, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
 - .2 ASTM D 1751-04, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non extruding and Resilient Bituminous Types).
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-19.24-M90, Multicomponent, Chemical-Curing Sealing Compound.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1/A23.2-2004, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CAN/CSA-A3000-03, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
 - .1 CSA-A3001-03, Cementitious Materials for Use in Concrete.
 - .3 CAN/CSA-G30.18-M92 (R2002), Billet-Steel Bars for Concrete Reinforcement.

1.3 MEASUREMENT
PROCEDURES

- .1 Reinforced concrete: cast-in-place reinforced concrete for the construction of the deadmen will be measured by the cubic metres (m³) by neat dimensions as shown on the plan.
- .2 Formwork and falsework will not be measured but

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considered incidental to the work.

- .3 No deductions will be made for volume of concrete displaced by reinforcing steel.
- .4 Heating of water and aggregate and providing cold weather protection such as insulated blankets will not be measured but considered incidental to the work.
- .5 Cooling of concrete and providing hot weather protection will not be measured but considered incidental to the work.
- .6 Supply and installation of concrete additives as recommended by the supplier will not be measured but considered incidental to the work.
- .7 Supply and installation of anchor bolts, nuts, washers and bolt grouting will not be measured but considered incidental to the work.

1.4 CERTIFICATES

- .1 Submit certificates in accordance with Section 01 33 00 Submittal Procedures.
- .2 Provide certification that plant, equipment, and materials to be used in concrete comply with requirements of CAN/CSA23.1.
- .3 Provide mix design in compliance with CSA-A23.1 to provide concrete of quality, yield and strength as specified under 2.2 Mix. Mix design to be prepared by and stamped by an Engineer licensed to practice in the Province of New Brunswick.
- .4 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:
 - .1 Portland cement.
 - .2 Blended hydraulic cement.
 - .3 Supplementary cementing materials.
 - .4 Admixtures,
 - .5 Aggregates.
 - .6 Water.

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- 1.5 SUBMITTALS
- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Shop Drawings:
 - .1 Submit placing drawings prepared in accordance with plans to clearly show size, shape, location and all necessary details of reinforcing.
 - .2 Submit drawings showing formwork and falsework design to: CSA-A23.1.
 - .3 Drawings to bear stamp and signature of qualified professional engineer registered or licensed in Province of New Brunswick, Canada.
- 1.6 WASTE MANAGEMENT AND DISPOSAL
- .1 Designate a cleaning area for concrete trucks off site, at a company owned site for such a purpose meeting all federal and provincial requirements.
 - .2 Use trigger operated spray nozzles for water hoses.
 - .3 Designate a cleaning area for tools to limit water use and runoff.
 - .4 Carefully coordinate the specified concrete work with weather conditions.
 - .5 Prevent plasticizers, water-reducing agents and air-entraining agents from entering drinking water supplies or waterways. Using appropriate safety precautions, collect liquid or solidify liquid with an inert, non-combustible material and remove for disposal.
 - .6 Choose least harmful, appropriate cleaning method which will perform adequately.

PART 2 - PRODUCTS

- 2.1 MATERIALS
- .1 Blended hydraulic cement: to CAN/CSA-A3001, Type 10.
 - .2 Water: to CSA-A23.1.
 - .3 Aggregates: to CAN/CSA-A23.1/A23.2. Coarse aggregates to be normal density.
 - .4 Reinforcing bars: to CAN/CSA-G30.18, Grade 400.
 - .5 Other concrete materials: to CSA-A23.1/A23.2.

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.6 Curing compound: to CSA A23.1/A23.2.

2.2 MIX DESIGN

- .1 The contractor shall be responsible for the concrete mix design.
- .2 It shall be the responsibility of the contractor to ensure that the mixture proportions shall be properly batched, mixed, placed and cured such that the concrete conforms to the specification.
- .3 Proportion normal density concrete in accordance with CAN/CSA-A23.1, Alternative 1, to give following properties:
- .1 Cement: Type 10 normal.
 - .2 Minimum compressive strength at 28 days: 35 MPa.
 - .3 Minimum cement content: 400 kg/m³ of concrete.
 - .4 Maximum water/cement ratio: 0.40.
 - .5 Class of exposure: C-1.
 - .6 Nominal size of coarse aggregate: 20 mm.
 - .7 Slump at time and point of discharge: 50 to 100 mm.
 - .8 Air content: 5 to 8%.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Inform Departmental Representative before placing concrete. Provide 48 hours notice prior to placing of concrete.
- .2 Pumping of concrete is permitted only after review of equipment and mix.
- .3 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .4 Prior to placing of concrete advise Departmental Representative 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.

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- 3.2 CONSTRUCTION .1 Perform cast-in-place concrete work in accordance with CSA-A23.1.
- 3.3 INSERTS .1 Cast in sleeves, ties, slots, anchors, reinforcement, frames, conduit, bolts, waterstops, joint fillers and other inserts required to be built-in.
.1 Sleeves and openings greater than 100 mm x 100 mm not indicated, must be reviewed by Departmental Representative.
- 3.3 FINISHES .1 Formed surfaces to CSA-A23.1.
- 3.4 SEALING .1 Following curing, apply two even coats of linseed oil mixture to clean dry surfaces, each at 8 m² /L. Allow first coat to dry before applying second coat. Apply poly-siloxane resin blend sealer at 4 m² /L.
- 3.5 SITE TOLERANCES .1 Finishing tolerance in accordance with CSA-A23.1.
- 3.6 FIELD QUALITY CONTROL .1 Concrete testing: to CSA-A23.1 by testing laboratory designated and paid for by Departmental Representative.
- 3.7 VERIFICATION .1 Quality Control Plan: ensure concrete supplier meets performance criteria of concrete as established in PART 2 - PRODUCTS, by Departmental Representative and provide verification of compliance as described in PART 1 - QUALITY ASSURANCE.
- 3.8 CLEANING .1 Use trigger operated spray nozzles for water hoses.
.2 Designate cleaning area for tools to limit water use

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and runoff.

- .3 Cleaning of concrete equipment to be done in accordance with Section 01 35 43: Environmental Procedures.

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PART 1 - GENERAL

1.1 RELATED
SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 19 - Construction/Demolition Waste Management And Disposal.
- .4 Section 35 51 24 - Float Installation.

1.2 Description

- .1 The work under this section will include:
 - .1 The fabrication, supply and installation of anchor bolts, machine bolts, lagscrews, and all other miscellaneous bolts, nuts, washers, plates and metal parts required for the completion of the work.
 - .2 Supply and installation of two (2) pairs of inter-float connections and any other items necessary for the complete installations, as indicated on the drawings.
 - .3 Supply and Installation of steel shackles and 32mm mooring chains as indicated on the drawings.
 - .1 Contractor will be responsible to determine the required lengths of chains required for each wavebreak..

1.3 MEASUREMENT
PROCEDURES

- .1 No separate payment under this section. Include costs in the unit bid item under section 35 51 24 - Float Installation.

1.4 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM B928/B928-07, Standard Specification for High Magnesium Aluminum-Alloy Sheet and Plate for Marine Service and Similar Environment.
 - .2 ASTM D 2000 Standard Classification System for Rubber Products in Automotive Applications
- .2 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-G40.20/G40.21-98, General Requirements for Rolled or Welded Structural Quality Steel.

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- .2 CAN/CSA-G164-M92 (R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 The Environmental Choice Program
 - .1 CCD-047a-98, Paints, Surface Coatings.
 - .2 CCD-048-98, Surface Coatings - Recycled Water-borne.
 - .4 CSA HA Series-M1980, CSA Standards for Aluminum and Aluminum Alloys.
 - .5 CAN3-S157-M83, Strength Design in Aluminum.
 - .6 CSA W59.2-M1991, Welded Aluminum Construction.
 - .7 CSA W57.2-M1987, Certification of Companies for Fusion Welding of Aluminum.
 - .8 CAN3-S157, Surface preparation of aluminum in contact with dissimilar materials.
 - .9 ASTM B928/B928-07 Standard Specification for High Magnesium Aluminum-Alloy Sheet and Plate for Marine Service and Similar Environment.
 - .10 CSA CAN3-S16.1-M78, Steel Structures for Building-Limit States Design.
 - .11 Do welding work to CSA W59-M1989 unless specified otherwise. Submit welder's certificate for review by Departmental Representative.
 - .12 ASTM D 2000 Standard Classification System for Rubber Products in Automotive Applications.
- 1.5 Source Quality Assurance
- .1 Prior to commencing of work, submit certified copy of mill reports covering chemical and physical properties of aluminum used in this work
- 1.6 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

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- Data Sheets in accordance with Section 01 33 00 -
Submittal Procedures. Indicate:
- .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. Indicate welds using CWB Welding Symbols.
 - .3 All submissions shall bear the stamp of qualified
Professional Engineer registered in the Province of
New Brunswick.
- 1.7 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.
- 1.8 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 Cover exposed stainless steel surfaces with
pressure sensitive heavy protection paper or apply
strippable plastic coating, before shipping to job
site.
 - .2 Leave protective covering in place until final
cleaning of building. Provide instructions for removal
of protective covering.
- 1.9 WASTE MANAGEMENT AND DISPOSAL
- .1 Separate and recycle waste materials in accordance with
Section 01 74 19 - 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, polystyrene, corrugated cardboard packaging material for recycling in accordance with Waste Management Plan.
- .4 Divert unused metal materials from landfill to metal recycling facility approved by Departmental Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Steel sections and plates: to CAN/CSA-G40.20/G40.21, Grade 300W.
- .2 Welding materials: to CSA W59, latest edition.
- .3 Welding electrodes: to CSA W48 Series.
- .4 Bolts and anchor bolts: to ASTM A 307.
- .5 Adhesive anchoring system to be HVA Capsule Adhesive Anchor System by Hilti or approved equal.
- .6 Stainless Steel Tubing: to ASTM A269
- .7 Wire nails and spikes shall conform to B111-1974.
- .8 Stainless Steel bolts: To AISI Steel Products Manual No. 13.
- .9 Cast iron: to ASTM A48-74.
- .10 Lagcrews and Machine Bolts:
 - .1 lagscrews shall meet the requirements of B18.23-8-M1979.
 - .2 Machine bolts will have standard heads, nuts, and threads and when in position will be of sufficient length to permit a full nut and two washers. Threads shall be the Coarse Thread Series as specified in the latest issue of ANSI B1-1 having a Class 2A tolerance.
 - .3 Standard cast iron washers suitable for the sizes of bolts specified will be placed under the heads and nuts of all machine bolts bearing on timber surfaces unless noted otherwise on drawings. Ogee washers to Timber Institute of Canada and as follows: ogee washers to be cast iron free from injuries, defects or impurities.
 - .4 As an alternative to ogee washers, standard plate washers can be used. The washer is to be three times

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bolt diameter and a minimum thickness of 6mm unless noted otherwise.

- .11 Galvanizing: hot dipped galvanizing with minimum zinc coating of 610g/sq.m. to CSA G164-M1981. All anchor bolts, machine bolts, spikes, lagscrews, nuts, washers, to be galvanized.
- .12 Galvanized primer: to CSB 1-GP-183M.
- .13 Steel sections, bars, tie rods, anchor dowels, plates and washers: to CSA G40.21-M1981, Type 300W.
- .14 Shackles to fit as required: grade 30.
- .15 Steel mooring chain:
Crosby Spectrum 3, 32mm diameter,
Working load Limit, 4500 Kilograms.

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 steel members and assembled units shall be hot dip galvanized to CSA G164-M81 (610g/sq.m) unless specified otherwise. All welded units are to be completed, including punching of connection bolt holds, prior to the units being hot dip galvanized. Pre-assembly of the framework shall be carried out to ensure no cutting, welding, or other fabrication will be necessary subsequent to hot dip galvanizing
- .6 The fabrication of all structural steel shall conform to the requirements of CSA CAN3-S16.1-M78.

2.3 FINISHES

- .1 Galvanizing: hot dipped galvanizing with zinc coating 610 g/m² to CAN/CSA-M81.

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- .2 Shop coat primer: to CAN/CGSB-1.40.
- .3 Zinc primer: zinc rich, ready mix to CAN/CGSB-1.181.
- 2.4 ISOLATION COATING
- .1 Isolate aluminum from following components, by means of bituminous paint:
- .1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.
 - .2 Concrete, mortar and masonry.
 - .3 Wood.
- 2.5 SHOP PAINTING
- .1 Apply one shop coat of primer to metal items, with exception of galvanized 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 Do welding work in accordance with CSA W59 unless specified otherwise.
- .2 Inspection and testing of materials and workmanship may be carried out by testing laboratory designated by Departmental Representative.
- .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 by other sections in accordance with shop drawings and schedule.

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- .7 Make field connections with bolts to CAN/CSA-S16.1, or weld.
- .8 Hand items over for casting into concrete to appropriate trades together with setting templates.
- .9 Touch-up 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.
- .11 Surface preparation of aluminum in contact with dissimilar materials to CAN3-S157. All locations to be treated as if they were in presence of moisture.
- .12 Obtain written permission from Departmental Representative prior to field cutting or altering of structural members.

3.2 Installation

- .1 Predrill holes for lagscrews in accordance with CSA 086-M84.
- .2 Machine bolts will have standard heads, nuts and threads and when in position will be of sufficient length to permit a full nut and two washers. Holes for machine bolts will be bored to the same diameter as that of the bolts.
- .3 Machine bolts will be placed in the work with their heads on the outside. The heads of the machine bolts that interfere with succeeding parts of the work being placed, or where directed by the Departmental Representative or shown on the drawings will be countersunk.
- .4 Standard cast iron washers or steel washers of the sizes indicated will be placed under the heads and nuts of all machine bolts bearing on timber surfaces, except where specified otherwise.
- .5 Where indicated, use steel washers of size shown.
- .6 Holes for spikes will be bored 1.5mm smaller than diameter of spike and 50mm less than the length of spike.

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- .7 Provide suitable and acceptable means of anchorage, such as dowels, anchor clips, bar anchors, bolts and washers, etc. as indicated on the drawings.

3.3 Protection

- .1 Take necessary care in handling, packing and shipping of all galvanized steel members to prevent damage to the galvanized coating. Evidence of damage to the galvanized members due to mishandling or lack of adequate protection shall be cause for rejection of the members.

3.4 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.

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Wood Treatment

Section 06 05 73

Page 1

PART 1 - GENERAL

1.1 RELATED
SECTIONS

- .1 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Section 35 00 00 - Dimension Timber.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA 080 Series-97, Wood Preservation.
 - .2 CSA 0322-02, Procedure for Certification of Pressure-Treated Wood Materials for Use in Preserved Wood Foundations.
 - .3 NLGA Standard grading rules for Canadian Lumber 1980 edition or most recent edition at time of tendering.

1.3 CERTIFICATES

- .1 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 080 Series-97 Series, Supplementary Requirement to AWPA M2 applicable to specified treatment.
 - .2 Moisture content after drying following treatment with water-borne preservative.

1.4 WASTE MANAGEMENT
AND DISPOSAL

- .1 Do not dispose of preservative treated wood through incineration or with other materials destined for recycling or reuse.

1.5 MEASUREMENT FOR
PAYMENT

- .1 No payment to be made under this section. Include costs in the unit bid price specified in section of work of this section in applicable sections where treatment is required.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Preservative Treatment: Treat to CSA 080 M1989 commodity standard 080.18, Table 1 and its reference for coastal waters.
- | | | |
|-----------------|-----|-------------------|
| .1 CCA | ACA | Kg/m ³ |
| Douglas Fir | 24 | 24 |
| Pacific Coast | 24 | 24 |
| Eastern Hemlock | 24 | 24 |

2.2 GRADING

- .1 All dimension timber shall be graded to the "National Lumber Grading Authority" (NLGA) or an equivalent "Canadian Lumber Standards Association Board" approved grading authority.

PART 3 - EXECUTION

3.1 APPLICATION:
PRESERVATIVE

- .1 Treat to CSA 080.18 Series using CCA preservative to obtain minimum net retention specified for Marine applications.

3.2 APPLICATION:
FIELD TREATMENT

- .1 Comply with AWPA M4 and revisions specified in CSA 080 Series-97 Series, Supplementary Requirements to AWPA M2.

3.3 TREATMENT

- .1 Apply three (3) brush coats of same preservative used in original treatment to all bolt holes, saw cuts and exposed untreated wood in field to CSA 080-M1989. Treat exposed ends or cuts with three (3) liberally brushed coats allowing sufficient interval between applications to permit total absorption and timber to dry. In the case of creosote, the preservative is to be applied hot.
- .2 Fill all unused bored holes with preservative and plug with treated wooden plugs.
- .3 Field cutting of timber after treatment is not permitted unless specifically approved by Departmental Representative.

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3.5 FIELD HANDLING

- .1 Carefully handle material to prevent damage to treated wood.
- .2 Damaged material will be rejected and replaced with new material.

3.6 DELIVERY AND STORAGE

- .1 Store timber horizontally, evenly supported and piled to permit air circulation when stored for prolonged periods.
- .2 When handling long timber, provide support at sufficient number of points, properly located to prevent damage due to excess 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.

3.7 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.
- .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 this contract.

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Timber Floating
Wavebreaks

Section 06 10 10
Page 1

PART 1 - GENERAL

1.1 DESCRIPTION

- .1 The work under this section will include the supply and fabrication of three (3) timber floating wavebreaks, complete with polystyrene billets, miscellaneous connectors and fasteners and all associated timber members.

1.2 MEASUREMENT
FOR PAYMENT

- .1 No separate payment will be made under this section. Include all cost in the unit bid item in Section 35 51 24, Floating Wavebreak Installations.
- .2 Acceptably constructed floating wavebreaks will include the supply and construction of all timber components, bolts, lag screws, washers, spikes, polystyrene, wavebreak connectors, pressure treatment, fasteners, steel sections, concrete anchors and all other items necessary to complete the work as specified in this contract or as shown on the drawings.

1.3 RELATED WORK

- .1 Section 03 30 00: Cast-in-Place Concrete
- .2 Section 05 50 00: Miscellaneous Metals
- .3 Section 06 05 73: Wood Treatment
- .4 Section 35 51 24: Wavebreak Installations

1.4 DIMENSIONS

- .1 Construct and install dimension timber, to dimensions indicated on drawings.
- .2 Check dimensions before commencing work and report discrepancies to Departmental Representative in writing.

1.5 SHOP DRAWINGS

- .1 Submit shop drawings as per Section 03 30 00.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Timber:

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Timber Floating
Wavebreaks

Section 06 10 10
Page 2

- .1 Species (to CAN3-086-M80):
 - .1 Treated - Douglas Fir, Pacific Coast Hemlock or Eastern Hemlock.
 - .2 Grade: No. 1 structural
 - .3 Grading Authority: NLGA
- .2 Preservative Treatment: All timber will be treated in accordance with Section 06 05 73.
- .3 Machine bolts, lag screws, nuts, washers, spikes, inter float connectors, etc.: All anchorage fasteners used in the work will be as specified in Section 05 50 00.
- .2 Polystyrene:
 - .1 Billets shall have an average density 24 kg/cu.m. and a minimum compressive strength of 0.11 MPa (Value at yield or 10% deflection whichever occurs first, to ASTM D1621-73). Maximum water absorption, 4.0% by volume to ASTM D2842-69.
- .3 Galvanizing:
 - .1 All bolts, anchors, nuts, lag screws, plates, washers, spikes, pipes, angles, HSS sections, straps, channels, bars, etc., shall be hot dipped galvanized in accordance with Section 05 50 00.
- .4 Rubber Units for Inter Float Connections: 178 mm x 254 mm x 200 mm marine engineered rubber. Weight: 57.3 kg/m. Reaction: 119 tonne/m. Energy: 4.5 tonne/m.
- .6 Metals in accordance with Section 05 50 00.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Install fasteners in accordance with Section 05 50 00.
- .2 Do installation of dimension timber to CSA 086-M84.
- .3 **Pre-cut timber prior to preservative treatment.**
- .4 Ensure that all timber, including any blocking fillers are straight, true, square and fit neatly to abutting surfaces.
- .5 Bore holes for machine bolts to same diameter as bolts.
- .6 Countersunk machine bolts where required as detailed on Plan.

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Timber Floating
Wavebreaks

Section 06 10 10
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3.2 HANDLING
TREATED TIMBER

- .1 Handle treated material to avoid damage causing alteration in original treatment.
- .2 Treat in field, cuts and damage to surface of treated material with appropriate preservative as described in CSA 080-M1983.
- .3 Ensure that all holes, cuts and damaged areas are thoroughly saturated with field treatment solutions as per CSA 080-M1983.

3.3 FLOATING
WAVEBREAK
CONSTRUCTION

- .1 Install machine bolts in accordance with Section 05 50 00.
- .2 Standard plate steel washers suitable for the sizes of the bolts specified will be placed under the heads and nuts of all machine bolts bearing on timber surfaces, except where specified otherwise.
- .3 All timber components are to be secured using 19 mm machine bolts as indicated on the plan, unless otherwise noted.
- .4 Secure 50 mm x 150 mm x 2640 mm timber straps, on top and bottom of every billet, as indicated on the plan.
- .5 Install the polystyrene billets in each bay as indicated on the plan.
- .6 Secure 200 mm x 200 mm x 455 mm long mooring posts with two (2) 37 mm diameter machine bolts, in pipe sleeves through the sheathing and 200 mm x 200 mm x 2280 mm long posts.
- .7 Every piece of 100 mm thick x 150 mm wide sheathing is to be attached to the 200 mm x 200 mm x 2280 mm long posts with 19 mm machine bolts, and staggered across the face of the wavebreak as to avoid having joints align.
- .8 Secure 100 mm x 200 mm brace to the 200 mm x 200 mm x 2280 mm long posts and to the 200 mm x 200 mm x 455 mm long block using 19 mm machine bolts.
- .9 200 mm x 200 mm x 1220 mm long spacers are to be bolted through the deck timbers and the 200 mm x 200 mm x 6100 mm long timbers, using 19 mm diameter machine bolts.
- .10 Inter-float connections are to be secured in place at the locations shown on the plan, with 19 mm diameter

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machine bolts, long enough to accommodate two nuts,
as shown on the detail.

- .11 200 mm x 200 mm deck timbers are to be bolted through
the 200 mm x 200 mm x 6100 mm long timbers as shown
on the plan.

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PART 1 - GENERAL

1.1 DESCRIPTION

- .1 This section specifies the general requirements for the transportation and installation of two floating wavebreaks, to the location indicated on the plan.

1.2 RELATED WORK

- .1 Section 03 30 00 - Cast-in-Place Concrete
.2 Section 05 50 00 - Miscellaneous Metals
.3 Section 06 10 10 - Timber Floating Wavebreaks

1.3 MEASUREMENT
FOR PAYMENT

- .1 Payment for this section will be paid by the unit. Included in the unit bid price is the Construction of the Floating Wavebreaks, Miscellaneous Metals specified and indicated on the drawings, Reinforced Concrete Anchors and Mooring Chains, Inter-Float Connections and any other items, necessary for the complete installation of the Timber Floating Wavebreaks to the locations indicated on the plans and as specified in the various sections of these specifications.
.1 This will include the furnishings, all equipment necessary for the complete supply, transportation and Installation of the floating Wavebreaks, to the locations indicated on the plan or as indicated by the Departmental Representative.

1.4 DELIVERY AND
HANDLING

- .1 Protect floating wavebreaks from damage due to excessive bending stresses, impact, or other causes during handling.
.2 Repair or replace damaged floating wavebreak members to satisfaction of the Departmental Representative, at Contractor's expense.
.3 Protect public and construction personnel, adjacent structures and work of other sections from hazards attributable to handling and moving of new floating wavebreaks.

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PART 2 - PRODUCTS

2.1 MATERIALS .1 Not Applicable

PART 3 - EXECUTION

- 3.1 INSTALLATION
OF FLOATING
WAVEBREAKS
- .1 Contractor is to transport floating wavebreaks to the installation area and place them as indicated on the plan.
 - .1 Including inter-float connections.
 - .2 Anchored to the reinforced concrete blocks.
 - .2 Method of pickup and placing of floating wavebreaks in water is to be submitted as per Section 01 33 00, for the Departmental Representative's approval.
 - .3 Any damage during launching is to be repaired and paid by the Contractor, at no additional cost to Canada.
- 3.2 FLOATING
WAVEBREAK
ANCHORAGE
- .1 Floating wavebreaks are to be anchored with the specified reinforced concrete anchor blocks with specified mooring chains and any other necessary components, to the location specified on the plan, or as directed by the Departmental Representative.