

Specifications Index

Small Craft Harbours  
Service Area Improvements  
New Floating Wharves Construction and Installation  
Skinner's Cove, Pictou County, NS

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Service Area Improvements

New Floating Wharves Construction and Installation

Skinner's Cove, Pictou County, NS

Project No. 723266

List of Drawings

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Small Craft Harbours

Service Area Improvements

New Floating Wharves Construction and Installation

Skinner's Cove, Pictou County, NS

List of Drawings

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Drawing No.      Title

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Cover

- 1      Chart, Existing Site Plan and Boreholes
- 2      New Service Area and Float Layout
- 3      New Concrete Retaining Wall Layout, Elevation and Details
- 4      New Galvanized Steel Strong Arm and Connection Details
- 5      New Aluminium Gangway and Details
- 6      General Arrangement, New Float Assembly, Sections & Details
- 7      Standard Float Plan View, Elevations & Details
- 8      Concrete Block Wall and Cross Section

PART 1 - GENERAL

- ..1 Scope .1 The work covered under this contract consists of the furnishing of all plant, labour, equipment and material for the New Service Area Improvements and New Floating Wharf Construction and Installation at Skinner's Cove, Pictou County, Nova Scotia, in strict accordance with specifications and accompanying drawings and subject to all terms and conditions of contract.
- ..2 Site Examination .1 All parties tendering should visit the site of the work prior to submission of tenders and make themselves thoroughly acquainted with site conditions, conditions of existing objects to be removed, tides, degree of exposure and all information necessary for the proper carrying out of the work covered by the drawings and this Specification. Submission of Tender will be deemed that Contractor is conversant with site conditions.
- .2 The *Departmental Representative* will give no consideration whatsoever to any claim by the Contractor resulting from failure to have made all the necessary investigations prior to tendering.
- ..3 Documents Required .1 Maintain at job site, one copy each of following:
- .1 Contract drawings;
  - .2 Specifications;
  - .3 Addenda;
  - .4 Reviewed shop drawings/submissions;
  - .5 Change orders;
  - .6 Other modifications to Contract;
  - .7 Field test reports;
  - .8 Copy of approved work schedule;
  - .9 Manufacturer's installation and application instructions; and
  - .10 All applicable permits

- 
- ..4 Work Schedule and Completion Dates
- .1 All work must be completed by July 29th, 2021.
  - .2 Prepare and submit to the *Departmental Representative* within five (5) days of notification of Contract award, one copy of the construction schedule in the form of a bar chart showing the dates for commencement and completion of each major activity of the work, including the work of subcontractors; dates for submissions, review and return of shop drawings, etc.; the dates of Substantial and Final Completion. If the schedule as submitted is deemed unacceptable in any way, submit without delay a revised schedule satisfactory to the *Departmental Representative*.
  - .3 The *Departmental Representative* is to notify the Contractor in writing of acceptance of the Construction Schedule. Comply with the Construction Schedule at all times. If, for any reason, the Construction Schedule is not followed, immediately notify the *Departmental Representative* of the change and submit a revised schedule for acceptance. Upon written acceptance by the *Departmental Representative*, this schedule will become the Construction Schedule.
  - .4 Whenever required, give further written particulars concerning this schedule. The submission to and acceptance by the *Departmental Representative* of the Contractor's Construction Schedule or the furnishing of details and particulars thereto will not relieve the Contractor of any duties and responsibilities under the Contract.
- ..5 Measurement Responsibilities
- .1 Notify *Departmental Representative* sufficiently in advance of operations to permit required measurements for payment purposes.

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- ..6 Contractor's Use of Site
- .1 The Contractor will not be permitted to use any existing wharf structures at the harbour for loading or offloading equipment.
  - .2 Co-operate with users of existing facilities. Should interferences occur, take directions from *Departmental Representative*.
  - .3 Do not unreasonably encumber site with materials or equipment.
  - .4 Move stored products or equipment which interfere with operations of *Departmental Representative* or other Contractors.
  - .5 Obtain and pay for use of additional storage or work areas needed for operations.
  - .6 Comply with all regulations and authorities having jurisdiction over the work, whether on land or on water.
  - .7 Ensure no damage occurs to existing structures as a result of operations. Any said damage will be repaired at Contractor's expense.
  - .8 Provide temporary barriers and warning signs in location where work is adjacent to areas used by public.
- ..7 Codes and Standards
- .1 Perform work in accordance with National Building Code of Canada (NBC) and any other code of provincial or local application provided that in any case of conflict or discrepancy, the more stringent requirements will apply.
  - .2 Meet or exceed requirements of specified standards, codes and referenced documents. When a standard or code is outdated, the latest edition will supersede the referenced date.

- .3 Observe and enforce construction safety measures by Canadian Construction Safety Code and Construction Safety Code of Nova Scotia. In the event of conflict between any provisions of above authorities the most stringent provision will apply.
- ..8 Project Meetings .1 *Departmental Representative* will arrange project meetings and assume responsibility for setting times and recording and distributing minutes.
- ..9 Setting Out of Work .1 Do all detail surveys necessary for the work, including locating and maintaining working points, and establishing lines and elevations. Perform all layout work, and carefully preserve benchmarks, reference points and stakes.
- .2 Provide such masts, scaffolds, batter boards, lines, straight edges, templates and other devices as may be necessary to facilitate layout, construction and inspection of the work. Whenever necessary, suspend work for such reasonable time as may be necessary to permit the *Departmental Representative* to check or inspect any portion of the Work. The Contractor will not be allowed any extra compensation or time for completion because of this suspension of work.
- .3 Elevations for the various grades and features of the specified works to be referenced and properly related to a benchmark, which will be approved by the *Departmental Representative*.
- .4 Verify all grades, lines, levels, and dimensions shown on the drawings and report any errors or inconsistencies to the *Departmental Representative* before commencing work. Provide and maintain well-built batterboards at all points to facilitate the progress of the work. Establish all other grades, lines, levels

required to facilitate the work.

..10 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 pedestrian and vehicular traffic.
- .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 acceptance from *Departmental Representative* for any shut-down or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.
- .4 Where unknown services are encountered, immediately advise *Departmental Representative* and confirm findings in writing.

..11 Contract Documents

- .1 Contract Drawings:
  - .1 The drawings for the Work consist of all drawings listed in these "Plans And Specifications" and any additional drawings issued at a later date by the *Departmental Representative*.
  - .2 *Departmental Representative* may furnish additional drawings to assist in proper execution of work. These drawings will be issued for clarification only. Such drawings will have same meaning and intent as if they were included with plans referred to in Contract Documents.
  - .3 The drawings indicate the extent and general dimensions of the work. Make all necessary measurements to ensure that the result of the work is in accordance with the intent.
  - .4 Verify all existing conditions in field prior to proceeding with work.

- .2 Contract Specifications:
  - .1 The general requirements and technical specifications are written solely for the General Contractor. They are organized into the NMS format of separate divisions and sections.
  - .2 Specification language is of the 'Short Form type' for example, where the word "provide" occurs, interpret it to mean "the Contractor shall furnish all labour, material and equipment necessary to complete the work".
  - .3 This Specification and accompanying drawings are intended to describe and provide for a finished project. They are intended to be complementary, and what is called for by either will be as binding as if called for by both. The Contractor shall understand that the work herein described will be complete in every detail, notwithstanding that every item necessarily involved is not particularly mentioned, and Contractor will be held to provide all labour, materials and equipment necessary for the entire completion of the work and will not avail himself of any errors or omissions.
  
- .12 Permits and Regulations
  - .1 Fisheries and Oceans Canada will obtain all federal and provincial permits required for the in-water and site works.
  - .2 Comply with all by-laws, ordinances and regulations of all authorities having jurisdiction.
  - .3 Apply, secure and pay for any other applicable provincial, municipal and NSPI permits required to complete the work according the plans and these specifications.



- ..13 Record of Construction
- .1 As work progresses, maintain accurate records to show all deviations from the contract drawings, with particular reference to work which will be concealed. Prior to the inspection of the work for the issuance of the Final Certificate of Completion, provide the *Departmental Representative* with one set of white prints of the drawings with all deviations shown neatly thereon and an electronic version in format acceptable to the *Departmental Representative*.
- ..14 Payment
- .1 Payment for all work under this contract to be according to the Contract.
- .2 No separate payment will be made for work specified under any sections of Specification under Division 01. The cost of this work is to be considered as overhead and to be included in the lump sum of the Contract.
- .3 Dimensional changes as directed by the *Departmental Representative* to suit existing conditions, but not resulting in additional work or materials, will not be considered as extra to the Contract.
- ..15 Maintenance of Shipping
- .1 Liaise with the local harbour officials to coordinate activities such that any interference is minimized.
- ..16 Cooperation & Assistance to Departmental Representative
- .1 Co-operate with *Departmental Representative* on inspection of work.
- .2 Provide assistance when requested.
- .3 Provide small motor boat with operator and sounding chain for *Departmental Representative's* use when requested.
- ..17 Datum
- .1 The datum referred to in this Specification is Chart Datum. Chart Datum is, by International Agreement a plane below which the tide will seldom fall. The

Canadian Hydrographic Service has adopted the plane of the lowest normal tide (L.N.T.) as Chart Datum. As the rise, fall, and range of tides varies daily, the Canadian Tide and Current Tables, as issued by the Canadian Hydrographic Service, should be consulted for tidal predictions and other tidal information relating to the work.

..18 Contractor's Representative

- .1 Continuously maintain on the site an authorized representative to whom communication may be addressed and who will be competent to speak for the Contractor in discussing work methods.

..19 Workers Compensation

- .1 Contractor and all sub-contractors must be registered under the Workers Compensation Act and provide evidence of good standing.
- .2 At completion of Contract and before final payment is made, the Contractor will present to the *Departmental Representative* a Letter of Certification from the Workers Compensation Board, showing that all required assessments are paid in connection with all trades.

..20 Laws, Standards Taxes and Fees

- .1 Comply with all laws and standards governing all or any part of the work, pay all applicable taxes and pay for all permits and certificates required in respect of the execution of the work. Where variances exist between the requirements of agencies governing all or any part of the work, the most restrictive will govern, but in no instance will the standards established by the drawings and this Specification, which exceed such requirements, be reduced.

..21 Protection and Repair

- .1 Take appropriate measures to protect exiting infrastructure and services.
- .2 Do not operate tracked equipment on concrete surfaces without suitable

- protection.
- .3 Repair any damage resulting from operations under this contract.
- ..22 Location of Equipment and Fixtures .1 Location of equipment, fixtures or any appurtenances indicated are to be considered approximate.
- ..23 Inspection and Testing .1 The *Departmental Representative* may employ an Inspector and/or Testing Company to ensure work conforms with contract.
- ..24 Disposal of Debris .1 Debris, including construction materials not incorporated in the work, oil products and containers, and other materials of this nature will be disposed of in suitable locations off the site. This includes costs of disposing of contaminated materials such as creosote treated timber. Disposal is the responsibility of the Contractor.
- .2 Material from the work will not be permitted to go adrift or otherwise become a menace to navigation.
- 1.25 Relics and Antiquities .1 Protect relics, antiquities, items of historical or scientific interest such as cornerstones and contents, commemorative plaques, inscribed tablets, and similar objects found during course of work.
- .2 Give immediate notice to *Departmental Representative* and await written instructions before proceeding with work in this area.
- .3 Relics, antiquities and items of historical or scientific interest remain Her Majesty's property.
- ..26 Temporary Navigational Buoys .1 The Contractor is to maintain temporary buoys as required to mark any obstructions as construction proceeds. All buoys are to meet the requirements of Canadian Coast

Guard Standard TP968 and be equipped with radar reflectors.

<http://www.ccg-gcc.gc.ca/folios/00020/docs/CanadianAidsNavigationSystem2011-eng.pdf>

- .2 The Contractor shall coordinate the buoy installation with the local harbour authority.
- .3 The Contractor is responsible for all costs associated with the supply, installation and removal of all temporary navigational buoys.

-----END of SECTION-----

## Service Area Improvements

## New Floating Wharves Construction and Installation

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Project No. 723266

## Project Particulars and Measurement for Payment

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PART 1 - PROJECT PARTICULARS

- 1.1 Description of Work .1 In general, the work under this contract includes but will not necessarily be limited to:
- .1 Mobilization and demobilization.
  - .2 Demolition and removal of existing items including three (3) reinforced concrete abutments, and excavation of in-situ soil for the fabrication and installation of the cast in place concrete retaining wall.
  - .3 Demolition and removal of existing overburden and rip rap materials.
  - .4 Demolition and removal of existing electrical system (utility pole, two (2) lights, main panel, tech cables, etc.).
  - .5 Supply and drive treated timber piles.
  - .6 Fabrication of cast-in-place reinforced concrete retaining wall.
  - .7 Load, supply and installation of rip-rap.
  - .8 Supply and installation of geotextile (filter fabric).
  - .9 Load, supply, installation and compaction of approved backfill (Fill Against Concrete).
  - .10 Supply, fabrication and installation of galvanized steel strong arms.
  - .11 Supply, fabrication and installation of aluminum gangways.
  - .12 Load, supply, fabrication and installation of galvanized steel connection plates.
  - .13 Supply, fabrication and installation of new floating wharves.
  - .14 Load, supply, installation and compaction of approved Type 1 gravel.
  - .15 Supply and installation of pre-cast concrete segmental retaining wall.
  - .16 Supply and installation of treated timber utility poles.

Part 2 - PROJECT 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 included in the pricing of each pay item as applicable.
- 2.2 Measurement for Payment .1 Mobilization and demobilization to the site will not be measured but paid Lump Sum. Include in this item, the cost to deliver materials and equipment to the site and to carry out all components of the work.
- .2 Demolition and removal of existing items including three (3) reinforced concrete abutments, and excavation of in-situ soil for the fabrication and installation of the cast in place concrete retaining wall will not be measured but paid Lump Sum. Include in this item removing or cutting off below grade any timber foundation piles under the concrete abutments. Upon removal, all existing materials to be become the property of the contractor and must be removed from DFO property.
- .3 Demolition and removal of existing overburden and rip rap materials will not be measured but paid Lump Sum. Include in this item that cost to sort and stockpile existing rip rap based on 50 percent salvage quantities as well as the cost to load, transport and unload overburden and unsuitable rip rap to the disposal site on the West side of the harbour as indicated on the plans.
- .4 Demolition and removal of existing electrical system (utility pole, two (2) lights, main panel, tech cables, etc.) will not be measured but paid Lump Sum. Include in this item all necessary

permits to disconnect and remove the electrical system. Upon removal, all existing materials except for the (2) LED luminaires and treated timber utility pole to become the property of the contractor and must be removed from DFO property. LED luminaires to be disconnected and unbolted from pole and turned over to the Harbour Authority along with the utility pole.

- .5 Load, supply and installation of new treated timber piles will be measured by the number of new units incorporated into the work. Include the cost to supply and install steel pile shoes and trimming / treating of each pile.
- .6 Supply and installation of reinforced concrete retaining wall will be measured by the cubic meter (m<sup>3</sup>) of concrete calculated from the nominal dimensions on the construction drawings. Include in this item the loading, supplying, installation and compaction of approved type I gravel for levelling the base of the wall prior to concrete installation.
- .7 Load, supply and installation of rip rap material will be measured by the cubic meter truck measure (CMTM) of new material incorporated into the work. Include in this item the reshaping of the slope and placing of salvaged rip-rap into the new work. Salvaged rip rap is estimated at 50 percent of overall requirement for rip rap slope protection.
- .8 Supply and installation of geotextile (filter fabric) to areas indicated on the construction drawings will not be measured but paid Lump Sum. Include in this item all securing pins, washers and other hardware for installation in accordance with product specifications.

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## Project Particulars and Measurement for Payment

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- .9 Load, supply, installation and compaction of approved granular backfill material (for new concrete retaining wall) will not be measured but paid Lump Sum.
- .10 Load, supply, fabrication and installation of galvanized steel strong arms will be measured by the number of new units incorporated into the work.
- .11 Load, supply, fabrication and installation of aluminum gangways will be measured by the number of new units incorporated into the work.
- .12 Load, supply, fabrication and installation of galvanized steel connection plates will be measured by the number of new units incorporated into the work. Include into this item all necessary washers and nuts to fasten the plates.
- .13 Load, supply, fabrication and installation of new floating wharves will be measured by the number of new units incorporated into the work. Include in this item all necessary buoyancy billets, aluminum checker plates along with all associated galvanized hardware.
- .14 Load, supply, installation and compaction of approved Type I gravel (except gravels used for levelling the retaining wall) will be measured by the cubic meter truck measure (CMTM) of material incorporated into the work.
- .15 Design, supply and installation of precast segmental concrete retaining wall will be measured by the square meter (m<sup>2</sup>) of concrete block wall (front face) incorporated into the work. Include into this item the cost to excavate, backfill and drainage piping associated with the engineering design required in the submittals for this retaining wall.



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- .16 Supply and installation of treated timber utility poles will be measured by the number of new units incorporated into the work.

-----END of SECTION-----

PART 1 - GENERAL

1.1 General

- .1 Submit to *Departmental Representative* for review submittals listed, including shop drawings, samples, certificates and other data, as specified in other sections of these Specifications.
- .2 Submit with 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. Where items or information is not produced in SI Metric units, provide converted values.
- .5 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 coordinated 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.
- .6 Notify *Departmental Representative*, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

- .7 Verify field measurements and affected adjacent work and coordinate.
  - .8 Contractor's responsibility for errors and omissions in submission is not relieved by *Departmental Representative's* review of submittals.
  - .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by *Departmental Representative's* review.
  - .10 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 will be returned for resubmission.
  - .11 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.
  - .12 Keep one reviewed copy of each submittal document on site for duration of Work.
- 1.2 Shop Drawings
- .1 Drawings to be originals prepared by Contractor, Subcontractor, Supplier or Distributor, which illustrate appropriate portion of work; showing fabrication, layout, setting or erection details as specified in appropriate Sections.
  - .2 Identify details by reference to sheet and detail numbers shown on Contract Drawings.
  - .3 Maximum sheet size 860 X 1120 mm.

Submittal Procedures

Page 3

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- .4 Reproductions for submissions: opaque diazo prints.
- 1.3 Product Data
- .1 Certain Specification Sections specify that manufacturer's standard schematic drawings, catalogue sheets, diagrams schedules, performance charts, illustrations and other standard descriptive data will be accepted in lieu of shop drawings.
- 1.4 Samples
- .1 Submit samples in sizes and quantities specified.
- .2 Construct field samples and mock-ups at locations acceptable to *Departmental Representative*.
- .3 Accepted samples will become standards of workmanship and material against which, installed work will be checked on project.
- 1.5 Miscellaneous Data
- .1 Provide certificates, methodologies, designs and test results as required.
- 1.6 Coordination of Submissions
- .1 Review shop drawings, product data, samples and miscellaneous data prior to submission.
- .2 Verify:
- .1 Field Measurements;
  - .2 Field Construction Criteria; and
  - .3 Catalogue numbers and similar data.
- .3 Coordinate each submission with requirements of work and Contract documents. Individual submissions will not be reviewed until all related information is available.
- .4 Contractor's responsibility for errors and omissions in submission is not relieved by *Departmental Representative's* review of submissions.
- .5 Contractor's responsibility for deviations in submission from requirements in Contract documents is not relieved by *Departmental*

*Representative's* review of submission, unless *Departmental Representative* gives written acceptance of specified deviations.

- .6 Notify *Departmental Representative*, in writing at time of submission, of deviations from requirements of Contract documents stating reasons for deviations.
- .7 After *Departmental Representative's* review, distribute copies.

1.7 Submission Requirements

- .1 Schedule submissions at least fourteen (14) days before dates reviewed submissions will be needed.
- .2 Submit number of copies of shop drawings, product data which Contractor requires for distribution, plus 2 copies which will be retained by *Departmental Representative*.
- .3 Accompany submissions with transmittal letter, in duplicate, containing:
  - .1 Date.
  - .2 Project title and number.
  - .3 Contractor's name and address. Identification and quantity of each shop drawing, product data and sample submitted.
  - .5 Other pertinent data.
- .4 Submissions shall include:
  - .1 Date and revision dates.
  - .2 Project title and number.
  - .3 Name and address of:
    - .1 Contractor
    - .2 Sub-Contractor
    - .3 Supplier
    - .4 Manufacturer
    - .5 Separate detailer when pertinent.
  - .4 Identification of product or material.
  - .5 Relation to adjacent structure or materials.

- .6 Field dimensions, clearly identified as such.
  - .7 Specification Section Number.
  - .8 Applicable standards, such as CSA or CGSB numbers.
  - .9 A Contractor's stamp, initialled or signed, certifying review of submission, verification of field measurements and compliance with Contract documents.
- 1.8 Shop Drawings Review
- .1 The review of shop drawings by Fisheries and Oceans Canada or its authorized consultant is for the sole purpose of ascertaining conformance with the general concept. This review shall not mean that Fisheries and Oceans Canada approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the construction and contract documents. Without restricting the generality of the foregoing, the Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for coordination of the work of all sub-trades.
- 1.9 Other Reviews
- .1 As for shop drawings above, other reviews are for the sole purpose of ascertaining conformance with the general concept.

1.1 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.

1.2 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 five (5) work days of notification of Bid Acceptance. Provide 2 copies.
  - .2 *Departmental Representative* will review Health and Safety Plan and provide comments.
  - .3 Revise the Plan as appropriate and resubmit within five (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.
- .5 Submit revisions and updates made to the Plan during the course of Work.
- .3 Submit name of designated Health and Safety Site Representative and support documentation specified in the Safety Plan.
- .4 Submit 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.
- 1.3 Compliance Requirements
  - .1 Comply with *Occupational Health and Safety Act* for Province of Nova Scotia, and Regulations made pursuant to the Act.
  - .2 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.
    - .1 The Canada Labour Code can be viewed at: <http://laws-lois.justice.gc.ca/eng/>



- .2 COSH can be viewed at: <http://laws-lois.justice.gc.ca/eng/regulations/SOR-86-304/index.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)
  - .3 Treasury Board of Canada Secretariat (TBS):
    - .1 Treasury Board, Fire Protection Standard April 1, 2010  
[www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=17316&section=text](http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=17316&section=text)
  - .4 Canadian Standards Association (CSA):
    - .1 CSA S350-M1980 (R2003), Code of Practice for Safety in Demolition of Structures.
  - .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.
- 1.4 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.

Service Area Improvements

New Floating Wharves Construction and Installation

Skinner's Cove, Pictou County, NS

Project No. 723266

Health and Safety Requirements

- .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.
- 1.5 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 Site, stop non-authorized entry, and to protect pedestrians and vehicular traffic around and adjacent to the Work and create a safe environment.
      - .2 Post signage at entry points and other strategic locations indicating restricted access and conditions for access.
      - .3 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.

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- .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.
- 1.6 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.
- 1.7 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.
- 1.8 Permits
  - .1 Post permits, licenses and compliance certificates at Work Site.
  - .2 Where a particular permit or compliance certificate cannot be obtained, notify *Departmental Representative* in writing and obtain approval to proceed before carrying out applicable portion of work.
- 1.9 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.

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- .3 Record results and address in Health and Safety Plan.
  - .4 Keep documentation on site for entire duration of the Work.
- 1.10 Project/Site Conditions
- .1 Following are potential health, environmental and safety hazards at the site for which Work may involve contact with:
    - .1 There are no known hazardous and controlled products stored on site.
    - .2 The following are known or potential project-related safety hazards at site:
      - .1 The work under this contract involves heavy equipment in a marine environment (in adverse weather conditions (e.g. wind, wave agitation, ice, etc.)
      - .2 Overhead and underground electrical lines at the site.
    - .3 Facility on-going operations:
      - .1 Vessel traffic navigating and berthed to harbour facilities within the harbour basin.
      - .2 Regular vehicle traffic on the access road, wharf and service area
  - .2 Above items shall not be construed as being complete and inclusive of potential health and safety hazards encountered during Work.
  - .3 Include above items in the hazard assessment of the Work.
- 1.11 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.
- 1.12 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 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 fire-fighting 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.

1.13 Safety Supervision

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

1.14 Training

.1 Use only skilled workers on Work Site who are effectively trained in occupational health and safety procedures and practices pertinent to their assigned task.

.2 Maintain employee records and evidence of training received. Make data available to Departmental Representative upon request.

.3 When unforeseen or peculiar safety-related hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise *Departmental Representative* verbally and in writing.

1.15 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.



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- 1.16 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.
- 1.17 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 \$5,000.00.
  - .2 Submit report in writing.
- 1.18 Hazardous Products
- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS).
  - .2 Keep MSDS data sheets for all products delivered to site.
    - .1 Post on site.
    - .2 Submit copy to *Departmental Representative*
- 1.19 Confined Spaces
- .1 Abide by occupational health and safety regulations regarding work in confined spaces.

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1.20 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.

1.21 Posting of Documents

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

-----END of SECTION-----

Part 1 - GENERAL

1.1 References

- .1 Canada Shipping Act, Transport Canada, 2001, amended 2013-12-01
- .2 Canadian Coast Guard Regulations, Fisheries and Oceans Canada
- .3 Impact Assessment Act, 2019, amended 2019-08-25
- .4 Canadian Environmental Protection Act, 1999, amended 2014-03-28
- .5 Fisheries Act, 1985, Fisheries and Oceans Canada, amended 2019
- .6 Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters, 1998
- .7 Migratory Birds Convention Act, 1994, Environment Canada, amended 2010-12-10
- .8 Canadian Navigable Waters Act, Transport Canada, amended 2019
- .9 Nova Scotia - Environment Act
- .10 Species at Risk Act, 2002, amended 2013-03-08
- .11 The Federal Policy on Wetland Conservation, 1991, Environment and Climate Change Canada
- .12 Transportation of Dangerous Goods Act, 1992, Transport Canada, amended 2009-06-16
- .13 Workplace Hazardous Materials Information System, Health Canada.

1.2 Definitions

- .1 Archaeological Resources: all tangible evidence of human activity that is of historical, cultural or scientific interest. Examples include features, structures, archaeological objects or

remains at or from an archaeological site, or an object recorded as an isolated archaeological find.

- .2 Buffer zone: a vegetated land that protects watercourses from adjacent land uses. It refers to the land adjacent to watercourses, such as streams, rivers, lakes, ponds, oceans, and wetlands, including the floodplain and the transitional lands between the watercourse and the drier upland areas.
- .3 Deleterious substance: (a) any substance that, if added to any water, would degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water, or (b) any water that contains a substance in such quantity or concentration, or that has been so treated, processed or changed, by heat or other means, from a natural state that it would, if added to any other water, degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water.
- .4 Fish habitat: spawning grounds and any other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or indirectly in order to carry out their life processes.
- .5 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.

- .6 Invasive or alien species: refers to a species or subspecies introduced outside its normal distribution whose establishment and spread threaten ecosystems, habitats or species with economic or environmental harm.
- .7 Navigable water: a canal and any other body of water created or altered as a result of the construction of any work.
- .8 Surface watercourse: refers to the bed and shore of a river, stream, lake, creek, pond, marsh, estuary or salt-water body that contains water for at least part of each year.
- .9 Wetlands: land where the water table is at, near or above the surface or which is saturated for a long enough period to promote such features as wet-altered soils and water tolerant vegetation. Wetlands include organic wetlands or "peatlands," and mineral wetlands that are influenced by excess water but produce little or no peat.

1.3 Transportation

- .1 Transport hazardous materials and hazardous waste in compliance with the *Transportation of Dangerous Goods Act*.
- .2 Prior to commencement of work, advise and seek approval from the *Departmental Representative* of the existing roads and temporary routes / roads proposed to be used to access work areas and to haul material to and from the site.
- .3 Vessels are to be permitted safe access through the worksite at all times, and assisted as necessary.

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- .4 All materials and equipment used in construction must be marked in accordance with the Collision Regulations of the *Canada Shipping Act, 2001* when located on the waterway.
- 1.4 Operation of Machinery
- .1 Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species and noxious weeds.
- .2 Whenever possible, operate machinery on land above the high water mark in a manner that minimizes disturbance to the banks and bed of the water body.
- .3 Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water.
- .4 Do not perform cleaning and washdown within a 30 metre buffer zone of a wetland, watercourse or other identified environmentally sensitive area.
- 1.5 Containment and Spill Management
- .1 Comply with Federal (*CEPA Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations*) and Provincial regulations, codes, standards and guidelines for the storage of fuel and allied petroleum products on site.
- .2 Do not dump petroleum products or any other deleterious substances on ground or in the water.
- .3 Be diligent and take all necessary precautions to avoid spills and contaminate the soil and water (both surface and subsurface) when handling petroleum products on site and during fueling and servicing of vehicles and equipment.

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- .4 Maintain on site appropriate emergency spill response equipment consisting of at least one 250-litre (55 gallon) overpack spill kit for containment and cleanup of spills.
  - .5 Maintain vehicles and equipment in good working order to prevent leaks on site.
  - .6 In the event of a petroleum spill, immediately notify the *Departmental Representative* and the Canadian Coast Guard (CCG) at 1-800-565-1633 (24 hour report line). Perform cleanup in accordance with all regulations and procedures stipulated by authority having jurisdiction.
  - .7 Materials such as paint, primers, blasting abrasives, rust solvents, degreasers, grout, or other chemicals are not to enter the watercourse.
  - .8 All equipment to be used in or over the marine environment is to be free from leaks or coatings of hydrocarbon-based fluids and/or lubricants harmful to the environment. Hoses and tanks are to be inspected on a regular basis to prevent fractures and breaks.
  - .9 In the event of a petroleum spill immediately notify the Canadian Coast Guard (CCG) at 1-800-565-1633 (24 hour reporting line and the *Departmental Representative*. Perform cleanup in accordance will all regulations and procedures stipulated by authorities having jurisdiction.
- 1.6 Hazardous Material Handling .1 Store and handle hazardous materials in accordance with applicable federal and provincial regulations, codes, standards and guidelines. Store in location that will prevent spillage into the environment.

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- .2 Label containers to WHMIS requirements and keep MSDS data sheets on site for all hazardous materials.
- .3 Maintain inventory of hazardous materials and hazardous waste stored on site. List items by product name, quantity and date when stored.
- .4 Store and handle flammable and combustible materials in accordance with National Fire Code.
- 1.7 Disposal of Wastes
  - .1 Do not bury rubbish, construction and demolition debris (i.e., concrete, timbers, steel, impacted soil, etc.) and waste materials on site.
  - .2 Construction material and debris are not allowed to become waterborne.
  - .3 Dispose and recycle construction and demolition debris and waste materials in accordance with provincial waste management regulations.
  - .4 Do not dispose of hazardous waste, volatile materials (such as mineral spirits, paints, thinners etc.) and petroleum products into waterways, storm sewers or in waste landfill sites.
  - .5 Dispose of hazardous waste in accordance with applicable federal and provincial, regulations, codes, standards and guidelines.
  - .6 Conduct daily clean-up of floating or sinking construction materials, litter, and other debris arising from the work site to ensure protection of the marine environment. Any construction debris/material that enters the marine environment must be removed immediately and be disposed of in a provincially approved manner.



- .7 Concrete waste:
  - .1 Do not discharge residual or rejected concrete on site.
  - .2 Immediately clean any accidental release of concrete on site prior to solidification.
  - .3 Do not wash and clean concrete vehicles on site.
  - .4 Perform dumping of residual material and truck cleaning operations only at the concrete plant. Follow environmental regulations and good practices as approved by the Provincial Department of the Environment and other authorities having jurisdiction.

- 1.8 Water Quality
  - .1 Contractor will be required to develop and implement an **Erosion and Sediment Control Plan** for the project site that minimizes risk of sedimentation of the water body during all phases of the work. The plan must be submitted to the *Departmental Representative* for approval and should, where applicable, include:
    - 1. Installation of effective erosion and sediment control measures before starting work to prevent sediment from entering the water body.
    - 2. Measures for managing water flowing to the site, as well as water being pumped/diverted from the site such that sediment is filtered out prior to the water entering a water body. For example, pumping/diversion of water to a vegetated area, construction of a settling basin or other filtration system.
    - 3. Measures for containing and stabilizing waste material (e.g., excavated material, construction waste and materials, uprooted or cut aquatic plants, accumulated debris) above the high water mark of nearby water bodies to prevent re-entry.

4. Regular inspection and maintenance of erosion and sediment control measures and structures during the course of the work.
  5. Repairs to erosion and sediment control measures and structures if damage occurs.
  6. Removal of non-biodegradable erosion and sediment control materials once site is stabilized.
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- .2 Where work may affect water quality, schedule work in cooperation with the Harbour Authority as directed by *Departmental Representative* to minimize interference and impact on harbour users.
  - .3 Assess weather conditions on a daily basis to determine the potential risk of extreme weather in the project area. Avoid work during periods which Environment and Climate Change Canada (ECCC) has issued rainfall or wave warning for the work area that may increase erosion and/or sedimentation.
  - .4 All rockfill and granular material that will be used for the project must be free of excessive fines, clean, non-ore bearing, non-toxic material (i.e., free from fuels, oil, grease and/or contaminants) and approved for use in marine infilling projects.
  - .5 Avoid introducing sediments (e.g. silt, clay and sand) in the water at all times. Where required, install effective sediment control measures before starting work to prevent the entry or re-suspension of sediment in the water body. Inspect sediment control measures regularly to ensure they are functioning properly, and make all necessary repairs if any damage occurs. Upon completion of use, remove these control measures in a way that

prevents the escape of settled sediment.

- .6 All soils resulting from the construction must be stabilized as soon as possible in order to control sediment runoff during and after construction.
- .7 Conduct in-water operations in such a manner to limit turbidity and reduce sediment suspension in the water to an absolute minimum at all times.
- .8 Visually monitor the water turbidity of the surrounding areas adjacent to the work and up to 100 meters. Should excessive change occur in the turbidity beyond the 100 meters which differs from existing conditions of the surrounding water bodies, such as a distinct colour difference; stop the work and notify the Departmental Representative to obtain appropriate mitigation measures to be followed.

1.9 Socioeconomic Restrictions

- .1 Abide by municipal and provincial regulations for any restrictions on work performed during the night time and with flood lighting of the site. Obtain applicable permits.
- .2 Place flood lights in opposite direction of adjacent residential and business areas.
- .3 Work equipment and machinery must be equipped with purposely designed mufflers to reduce noise on site to lowest possible level. Maintain mufflers in good operating condition at all times.
- .4 The Contractor will coordinate with the local Harbour Authority prior to commencement of the project activities such that the schedule with the least possible conflicts will be implemented.

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- 1.10 Fish Protection .1 Ensure that all in-water activities, or associated in-water structures, do not interfere with fish passage, constrict the channel width, or reduce flows.
- 1.11 Bird and Bird Habitat .1 Become knowledgeable with and abide by the *Migratory Birds Convention Act (MBCA)* in regards to the protection of migratory birds, their eggs, nests and their young encountered on site and in the vicinity.
- .2 Minimize disturbance to all birds on site and adjacent areas during the entire course of the Work.
- .3 Do not approach concentrations of seabirds, waterfowl and shorebirds when anchoring equipment, accessing wharves or ferrying supplies.
- .4 During night time work, position flood lights in opposite direction of nearby bird nesting habitat.
- .5 Do not use beaches, dunes and other natural previously undisturbed areas of the site to conduct work unless specifically approved by the *Departmental Representative*.
- .6 Should nests of migratory birds in wetlands be encountered during work, immediately notify *Departmental Representative* for directives to be followed.
- .1 Do not disturb nest site and neighbouring vegetation until nesting is completed.
- .2 Minimize work immediately adjacent to such areas until nesting is completed.
- .3 Protect these areas by following recommendations of Canadian Wildlife Service.

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- .7 All machinery must be well muffled. If necessary, trucks may be required to avoid the use of "hammer" braking along specific sections of the route.
- 1.12 Species at Risk and Marine Mammals .1 Maintain periodic visual surveys for leatherback sea turtles and marine mammals in and around the project area. In the event of a sighting within a 500 m radius of the project area, work must be curtailed until the animal(s) has departed the area, at which time the work can resume.
- 1.13 Air Quality .1 Keep airborne dust and dirt resulting from the work on site to an absolute minimum.
- .2 Dust suppression by the application of water must be employed, when required. Apply dust control measures to roads, parking lots and work areas. The *Departmental Representative* shall determine locations where water is to be applied, the amount of water to be applied, and the times at which it shall be applied. Waste oil must not be used for dust control under any circumstances.
- .3 Spray surfaces with water or other environmentally approved product. Use purposely suited equipment or machinery and apply in sufficient quantity and frequency to provide effective result and continued dust control during the entire course of the work.
- .4 Do not use oil or any other petroleum products for dust control.
- 1.14 Fires .1 Fires and burning of rubbish on site is not permitted.
- 1.15 Archaeological .1 All construction personnel are responsible for reporting any unusual materials unearthed during construction to the construction supervisor. If the find is

believed to be an archaeological resource, the Construction Supervisor will immediately stop work in the vicinity of the find and notify the *Departmental Representative*.

- .2 If an archaeological and / or historically significant item is discovered during the work activities, work in the area will be stopped immediately and the *Departmental Representative* will be contacted as well as the provincial Archaeological Services unit.
  - a) Nova Scotia - NS Department of Communities, Culture and Heritage, Special Places Program, telephone: (902) 424-6475.
- .3 Work can only resume in the vicinity of the find when authorized by the *Departmental Representative* and Construction Supervisor, after approval has been granted by the Nova Scotia Department of Communities, Culture and Heritage.
- .4 In the event of the discovery of human remains or evidence of burials, excavation work will immediately cease and nearest law enforcement agency will be contacted immediately by the *Departmental Representative* and/or the Construction Supervisor.

-----END of SECTION-----

Part 1 - GENERAL

1.1 Inspection

- .1 Provide 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.

- .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 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.
- 1.4 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.



PART 1 - GENERAL

- 1.1 Access
- .1 Provide and maintain adequate access to project site.
  - .2 If authorized to use existing roads or structures for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractor's use of roads.
  - .3 The contractor is to maintain full access to the work site. Should a court injunction be required ordering a person or group to refrain from impeding access to the site, such as a demonstration, picketing or union action, then obtaining the injunction and any associated costs will be considered incidental to this contract. Any delays associated with such activity will be considered incidental to this contract.
- 1.2 Contractor's Site Office
- .1 Not required.
  - .2 Keep on site a copy of contract documents, all letters, orders, notices and other communications as well as all other materials as specified under Section 01 10 10.
- 1.3 Storage Sheds
- .1 Contractor to make his own arrangements for on-site storage areas.
  - .2 Provide adequate weather tight sheds with raised floors, for storage of materials, tools and equipment which are subject to damage by weather.
- 1.4 Sanitary Facilities
- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

Temporary Facilities

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|                                   | .2 | Post notices and take such precautions as required by local health authorities.  |
| 1.5 <u>Parking</u>                | .1 | Contractor to make own arrangements to provide parking space for workers.  |
| 1.6 <u>Power</u>                  | .1 | Arrange, pay for and maintain temporary electrical power supply in accordance with governing regulations and ordinances.   |
|                                   | .2 | Install temporary facilities for power such as poles, lines and cables to approval of local electric utility.  |
| 1.7 <u>Barricades</u>             | .1 | Provide and maintain sufficient barricades, fencing, notices, warning signs, light signals, etc. for the protection of adjoining property and to warn others and workers engaged on the job of the dangers caused by the work. |
|                                   | .2 | Types and location of barricades, etc. to be in accordance with local regulations and to the satisfaction of <i>Departmental Representative</i> .  |
|                                   | .3 | The presence of such barricades, lights, etc. shall not relieve the Contractor of the responsibility for any damages.  |
| 1.8 <u>Security</u>               | .1 | Contractor to make his own arrangements for security of his equipment, materials, damages resulting from fire and theft.   |
| 1.9 <u>Site Signs and Notices</u> | .1 | Only Project Identification and Consultant/ Contractor signboards and notices for safety or instruction are permitted on site.   |
|                                   | .2 | Format, location and quantity of site signs and notices to be accepted by <i>Departmental Representative</i> .   |

Temporary Facilities

- .3 Signs and notices for safety or instruction to be in English and French languages, or commonly understood graphic symbols.
- 1.10 Removal of Temporary Facilities
  - .1 Remove temporary facilities from site when directed by *Departmental Representative*.
  - .2 If project is closed down for a period of time, keep temporary facilities operational until no longer required by *Departmental Representative*.

-----END of SECTION-----

## Service Area Improvements

## New Floating Wharves Construction and Installation

Skinner's Cove, Pictou County, NS

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**Material and Equipment****Page 1**

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- 1.1 General
- .1 Use new material and equipment unless otherwise specified.
  - .2 Submit following information for any or all materials and products proposed for supply within seven (7) days of request by *Departmental Representative*:
    - .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.
  - .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.
- 1.2 Manufacturer's Instructions
- .1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.
  - .2 Notify *Departmental Representative* in writing of any conflict between these specifications and manufacturer's instructions. *Departmental Representative* will designate which document is to be followed.
- 1.3 Delivery and Storage
- .1 Deliver, store and maintain packaged material and equipment with manufacturer's seal and labels intact.
  - .2 Prevent damage, adulteration and soiling of material and equipment during delivery, handling and storage. Immediately remove rejected material and equipment from site.

Material and Equipment

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- .3 Store material and equipment in accordance with supplier's instructions.
- 1.4 Conformance .1 When material or equipment is specified by standard or performance specifications, upon request of *Departmental Representative*, obtain from manufacturer an independent testing laboratory report, stating that material or equipment meets or exceeds specified requirements.
- 1.5 Substitution .1 Proposals for substitution may be submitted only after award of Contract. Such requests must include statements of respective costs of items originally specified and proposed substitutions.
- .2 Proposals will be considered by *Departmental Representative* if:
- .1 Products selected by tenderer from those specified, are not available, or
  - .2 Delivery date of products from those specified would unduly delay completion of Contract, or
  - .3 Alternative products to those specified, which are brought to attention of, and considered by *Departmental Representative* as equivalent to those specified and will result in a credit to Contract amount.
- .3 Should proposed substitution be accepted either in part or in whole, assume full responsibility and costs when substitution affects other work on project. Pay for design or drawing changes required as result of substitution.
- .4 Amounts of all credits arising from approval of substitutions will be determined by *Departmental Representative* and Contract price will be reduced accordingly. No substitutions will be permitted without prior written approval

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Material and Equipment

of *Departmental Representative*.

.5 *Departmental Representative* reserves the right for acceptance or rejection of substitution of materials.

1.6 Construction Equipment and Plant

.1 Upon 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.

1.7 Damaged and Rejected Materials

.1 Immediately replace, repair or otherwise make good any material damaged, broken or defaced during construction to the satisfaction of *Departmental Representative*.

.2 Remove rejected materials from site.

-----END of SECTION-----

PART 1 - GENERAL

- 1.1 General
- .1 Conduct cleaning and disposal operations to comply with all applicable laws and ordinances.
  - .2 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
  - .3 Prevent accumulation of waste which create hazardous conditions.
  - .4 Provide adequate ventilation during use of volatile or noxious substances.
- 1.2 Cleaning During Construction
- .1 Maintain the work, at least on a daily basis free from accumulations of waste material and debris.
  - .2 Provide on-site containers for collection of waste materials, and debris.
  - .3 Remove all waste and debris from site.
  - .4 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet concrete or newly painted surfaces.
- 1.3 Final Cleaning
- .1 In preparation for acceptance of the project on an interim or final certificate of completion perform final cleaning.
  - .2 Remove grease, dust, dirt, stains, and other foreign materials from finished surface.
  - .3 Remove surplus materials, rubbish, tools and equipment.

PART 1 - GENERAL

- 1.1 Related Sections .1 Section 03 30 00: Concrete
- .2 Section 31 11 00: Sitework, Demolition and Removals
- 1.2 Measurement Procedures .1 No measurement for payment will be made under this section. Include costs in items of concrete work for which formwork is required.
- 1.3 References .1 Canadian Standards Association (CSA International)
- .1 CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
- .2 CAN/CSA-O86-09, Engineering Design in Wood.
- .3 CSA O121-08, Douglas Fir Plywood.
- .4 CSA O151-04, Canadian Softwood Plywood.
- .5 CSA O153-M1980 (R2008), Poplar Plywood.
- .6 CSA S269.1-1975 (R2008), Falsework for Construction Purposes.
- .7 CAN/CSA-S269.3-M92 (R2003), Concrete Formwork, National Standard of Canada
- 1.4 Submittals .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special exposed finishes, ties, liners, anchorages, and locations of temporary embedded parts. Comply with CSA S269.1, for falsework drawings Comply with CAN/CSA-S269.3 for formwork drawings.
- .3 Indicate formwork design data: permissible rate of concrete placement, and temperature of concrete, in forms.



## Service Area Improvements

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**Concrete Formwork and Accessories****Page 2**

- .4 Indicate sequence of erection and removal of formwork/falsework as directed by *Departmental Representative*.
- 1.5 Delivery, Storage and Handling
- .1 Store and manage hazardous materials in accordance with Construction/Demolition Waste Management and Disposal.
- .2 Waste Management and Disposal:
- .1 Separate waste materials for reuse and recycling.
- .2 Place materials defined as hazardous or toxic in designated containers.
- .3 Divert wood materials from landfill to a recycling facility.
- .4 Divert plastic materials from landfill to a recycling facility.
- .5 Divert unused form release material from landfill to an official hazardous material collections site.

**PART 2 - PRODUCTS**

- 2.1 Materials
- .1 Formwork materials:
- .1 Formwork materials to be to CAN/A23.1/A23.2.
- .2 Wood and wood product formwork materials to be to CSA-0121, CAN/CSA-086 and CSA-0153.
- .2 Form ties:
- .1 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, biodegradable.
- .4 Form stripping agent: colourless mineral oil, non-toxic, and biodegradable.
- .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 Fabricate and erect falsework in accordance with CSA S269.1.
  - .3 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 CSA-A23.1/A23.2.
  - .4 Align form joints and make watertight.
    - .1 Keep form joints to minimum.
  - .5 Build in anchors, sleeves, and other inserts required to accommodate work specified in other sections.
  - .6 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.
- 3.2 Formwork Removal
- .1 Leave formwork in place for minimum of three (3) days after placing concrete.
  - .2 Remove formwork when concrete has reached 75% of its design strength or minimum period noted above, whichever comes later.
  - .3 Re-use formwork and falsework subject to requirements of CSA-A23.1/A23.2.

-----END of SECTION-----

**PART 1 - GENERAL**

- 1.1 Related Work
- .1 Section 03 10 00: Concrete Formwork and Accessories
  - .2 Section 03 30 00: Concrete
- 1.2 Measurement Procedures
- .1 No measurement for payment will be made under this section. Include costs in items of concrete work for which reinforcement is required.
- 1.3 References
- .1 American Society for Testing and Materials International (ASTM)
    - .1 ASTM A82/A82M-07, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
  - .2 Canadian Standards Association (CSA)
    - .1 CAN/CSA-A23.1-09, Concrete Materials and Methods of Concrete Construction/Methods and Standard Practices for Concrete.
    - .2 CAN/CSA-A23.3-04, Design of Concrete Structures.
    - .3 CAN/CSA-G30.18-09, Carbon Steel Bars for Concrete Reinforcement.

**PART 2 - PRODUCTS**

- 2.1 Materials
- .1 Substitute different size bars only if permitted in writing by *Departmental Representative*.
  - .2 Reinforcing steel: carbon steel, having a yield stress of 400 MPa, deformed bars to CAN/CSA-G30.18, unless indicated otherwise.
  - .3 Cold-drawn annealed steel wire ties: to ASTM A82/A82M.
  - .4 Chairs, bolsters, bar supports, spacers: to CAN/CSA-A23.1.

Concrete Reinforcement

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- 2.2 Fabrication
- .1 Fabricate reinforcing steel in accordance with CAN/CSA-A23.1 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.
  - .2 Obtain *Departmental Representative's* approval for locations of reinforcement splices other than those shown on placing drawings.
  - .3 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.
- 2.3 Source Quality Control
- .1 Upon request, provide *Departmental Representative* with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis.

**PART 3 - EXECUTION**

- 3.1 Field Bending
- .1 Do not field bend or field weld reinforcement.
- 3.2 Placing Reinforcement
- .1 Place reinforcing steel as indicated on reviewed placing drawings and in accordance with CAN/CSA-A23.1.
  - .2 Prior to placing concrete, obtain *Departmental Representative's* approval of reinforcing material and placement.
  - .3 Give *Departmental Representative* at least two (2) days' notice prior to placement of concrete for scheduling of inspection of reinforcement steel.
  - .4 Ensure cover to reinforcement is maintained during concrete pour.

-----END of SECTION-----

PART 1 - GENERAL

- 1.1 Related Sections
- .1 Section 01 29 00: Project Particulars and Measurement for Payment
  - .2 Section 01 35 44: Environmental Protection Procedures for Marine Work
  - .3 Section 03 10 00: Concrete Forming and Accessories
  - .4 Section 03 20 00: Concrete Reinforcement
  - .5 Section 01 45 00: Testing and Quality Control
- 1.2 Measurement Procedures
- .1 No deductions will be made for volume of concrete displaced by reinforcing steel.
  - .2 Heating of water and aggregates and providing cold weather protection will not be measured but considered incidental to work.
  - .3 Cooling of concrete and providing hot weather protection will not be measured but considered incidental to work.
  - .4 Supply and installation of concrete additives as recommended by the supplier will not be measured but considered incidental to work.
- 1.3 References
- .1 American Society for Testing and Materials International (ASTM)
    - .1 ASTM C260/C260M-10a, Standard Specification for Air-Entraining Admixtures for Concrete.
    - .2 ASTM C309-11, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
    - .3 ASTM C494/C494M-10a, Standard Specification for Chemical Admixtures for Concrete.
    - .4 ASTM C881/C881M-10, Standard Specification for Epoxy-Resin-Base

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- Bonding Systems for Concrete.
- .5 ASTM D1751-04(2008), Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
- .2 Canadian Standards Association (CSA)
  - .1 CSA-A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
  - .2 CSA A283-06, Qualification Code for Concrete Testing Laboratories.
  - .3 CAN/CSA-A3000-08, Cementitious Materials Compendium.
- 1.4 Certifications
  - .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/CSA-A23.1.
  - .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 Nova Scotia.
  - .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.

- 1.5 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, noncombustible 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: Type GUb-F/SF to CAN/CSA-A3001.
  - .2 Supplementary cementing materials: to CAN/CSA-A3001.
  - .3 Water: to CAN/CSA-A23.1.
  - .4 Aggregates: to CAN/CSA-A23.1/A23.2. Coarse aggregates to be normal density.
  - .5 Air entraining admixture: to ASTM C 260.
  - .6 Chemical admixtures: to ASTM C 494/C 494M. *Departmental Representative* to approve accelerating or set retarding

Concrete

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- admixtures during cold and hot weather placing.
- .7 Concrete retarders: to ASTM C 494/C 494M water based, low VOC, solvent free. Do not allow moisture to come in contact with the retarder film.
  - .8 Curing Compound:
    - .1 To CSA-A23.1, and ASTM C309.
    - .2 Acceptable Products:
      - .1 Kure-N-Seal WB by BASF Building Systems.
      - .2 Florseal WB 18 by Sika Canada.
      - .3 1100 Cure by W.R. Meadows.
  - .9 Isolation/Control Joint Filler:
    - .1 Polyethylene closed-cell foam filler. To be Deck-O-Foam by W.R. Meadows, or approved alternate.
  - .10 Joint Sealer for Joints in Slab:
    - .1 Sikaflex 2C NS/SL as supplied by Sika Canada, or approved alternate.
  - .11 Anchorage Adhesive (Above Water): to ASTM C881/C881M, Type IV, Grade 3, Class A, B, and C.
    - .1 Acceptable Products:
      - .1 Epcon Acrylic 7 by ITW Ramset/Red Head.
      - .2 HIT HY200 A/R MAX Injection Adhesive System by HILTI.
      - .3 Acrylic-Tie Anchoring System by Simpson Strong-Tie.
      - .4 Alternate Materials: Approved by addendum in accordance with Instructions to Tenderers.
  - .12 Smooth Bar Dowels: Steel rod to CSA G40.21, Grade 300W. Ends cut and filed free of burrs.
  - .13 Sleeves for smooth bar dowels: PVC Schedule 40 pipe, size as indicated on drawings.



- 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 specifications.
  - .3 Use ready mix concrete designed to produce air entrained concrete to comply CAN/CSA A23.1-14.
  - .4 Concrete Mix:
    - .1 Minimum compressive strength at 28 days: 35 MPa.
    - .2 Minimum cement content: 400 kg/m<sup>3</sup> of concrete.
    - .3 Maximum water/cement ratio: 0.40.
    - .4 Class of exposure: C-1.
    - .5 Nominal size of coarse aggregate: 20 mm.
    - .6 Slump at time and point of discharge: 50 to 100mm.
    - .7 Air content: 6 to 8 %.

PART 3 - EXECUTION

- 3.1 Preparation
- .1 Provide 48 hours' notice to *Departmental Representative* 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*.
- 3.2 Construction .1 Do cast-in-place concrete work in accordance with CAN/CSA-A23.1.
- 3.3 Control Joint Dowels .1 Dowels at control joints shall be evenly spaced as indicated on the drawings, and aligned perpendicular to the joint and parallel to each other within the following tolerances:
- .1 Deviation not exceeding one degree from perpendicular to joint.
  - .2 Parallel to each other within a tolerance of 0 degrees 45 minutes (approximately 3 mm in 225mm).
- .2 Dowels With Sleeves: Apply thin even film of mineral lubricating grease to dowel end before inserting in sleeve.
- .3 Dowels Without Sleeves:
- .1 Paint portion of dowel intended to move within hardened concrete with one coat of asphalt paint.
  - .2 When paint is dry, apply thin even film of mineral lubricating grease.
- 3.4 Finishing .1 Only ACI (American Concrete Institute) certified or other pre-approved concrete finishers are to be utilized in finishing all concrete works.
- .2 Finish concrete in accordance with CAN/CSA-A23.1.
- .1 Concrete Surfaces:
    - .1 Float surfaces with wood or metal floats or power finishing machines and bring surfaces to true grade or dimensions.
    - .2 Use curing compounds compatible with applied finish on concrete surfaces. Provide written

declaration that compounds used are compatible.

- .3 Broom finish surface with coarse bristle obtaining a coarse textured finish with a non-slip finish. All brush strokes to be in the direction perpendicular to traffic.

3.5 Site Tolerance

- .1 Concrete tolerance in accordance with CAN/CSA-A23.1.
  - .1 Slab surface to be to Table 22 Class B, non-slip, straight edge, value  $\pm 6$  mm.

3.6 Field Quality Control

- .1 Inspection and testing of concrete and concrete materials will be carried out by a Testing Laboratory designated by *Departmental Representative* in accordance with CAN/CSA-A23.1 and Section 01 45 00 Testing and Quality Control.
  - .2 *Departmental Representative* will assume all costs associated with collection of samples and testing concrete.
  - .2 *Departmental Representative* will take additional test cylinders during cold weather concreting.
  - .3 Non-destructive Methods for Testing Concrete shall be in accordance with CAN/CSA-A23.2.

-----END of SECTION-----

PART 1 - GENERAL

- 1.1 Reference Standards
- .1 ASTM A123/A123 M-13 Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products (with minimum zinc coating of 600 g/m<sup>2</sup>).
  - .2 ASTM A307-14, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile.
  - .3 ASTM B111-1974 (or latest edition), Wire Nails, Spikes and Staples.
  - .4 CAN/CSA-G40.21-13, Structural Quality Steels.
  - .5 CAN/CGSB-1.181-1999 (or latest edition), Ready-Mixed Organic Zinc-Rich Coating.
  - .6 CAN/CSA-S16-14, Design of Steel Structures.
  - .7 CSA W59-13, Welded Steel Construction (Metal Arc Welding).
  - .8 CSA-W47.2-11, Certification of companies for fusion welding of aluminum.
- 1.2 Shop Drawings
- .1 Submit shop drawings for all items not detailed on the plans in accordance with Section 01 33 00.
  - .2 Contractor is responsible to review project plans for accuracy of the detail dimensions, general fit-up of parts to be assembled, adequacy of proposed methods and procedures or for errors or defects contained in the details.
  - .3 Indicate materials, core thicknesses, finishes, connections, joint, method of anchorage, number of anchors, supports, reinforcement, details and accessories.
  - .4 Contractor's responsibility to confirm on site the exact locations and construction of related work to which work under this section connects to, or is supported on.

- 1.3 Source Quality Control .1 The Contractor is to provide written documentation from the Canadian Welding Bureau certifying that all welders used for this work are qualified to the requirements of CSA-W47.1, Division 1 or 2.1 and CSA-W47.2.
- 1.4 Quality Assurance .1 Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

PART 2 - PRODUCTS

- 2.1 Materials
- .1 All steel will be hot-dipped galvanized unless otherwise indicated.
- .2 Steel Sections: to CAN3-G40.21, Grade 350W.
- .3 Steel plates and angles: to CAN#-G40.21, Grade 300W.
- .4 Welding materials: to CSA W59.
- .5 Bolts and anchor bolts: to ASTM A307.
- .6 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m<sup>2</sup> to ASTM A123/A123M.
- .7 Zinc primer: Zinc rich, ready mix to CGSB 1-GP-181.
- .8 Aluminum to consist of 6061-T6 Marine grade alloy.
- .9 Aluminum welding to be MIG welding with S356 filling alloy in accordance with CAS W47.2-M procedure.
- .10 Do not use items manufactured or fabricated from scrap steel of unknown chemical composition or physical properties.
- 2.2 Fabrication
- .1 Build work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

- .2 Fabricate items from steel unless otherwise noted.
- .3 Where possible, fit and shop assemble work, ready for installation.
- .4 Ensure exposed welds are continuous for length. File or grind exposed welds smooth and flush.

PART 3 - EXECUTION

3.1 General

- .1 Do steel work in accordance with CAN/CSA-S16.
- .2 Do welding work in accordance with CSA W47.1 and CSA W47.2 unless specified otherwise.
- .3 Erect metal work square, plumb, square, and true, accurately fitted, with tight joints and intersections.

3.2 Welding Inspection

- .1 The Contractor is responsible to assure that materials, fabrication, and examination procedures for all welding conforms to CSA W59 and W59.2.

-----END of SECTION-----

PART 1 - GENERAL

- 1.1 Reference Standards
- .1 CAN/CSA-080 Series 08(R2012) Wood Preservation.
  - .2 CSA 086-14, Engineering Design in Wood (Limit States Design).
  - .3 Copper naphthenate containing 2% copper for brush or spray treatment for field cuts.
  - .4 NLGA standard grading rules for Canadian Lumber 2013 edition or most recent edition at time of tendering.

PART 2 - PRODUCTS

- 2.1 Materials
- .1 Softwood Dimension Timber:
    - .1 Sound seasoned wood with ends square.
    - .2 Dimensions as indicated on the contract drawings including chamfering and beveling as indicated.
    - .3 Straight, free from loose knots, sweep, shakes, rot and checks.
    - .4 All decking to be dressed on one side for uniform thickness.
    - .5 Grade 1 to National Lumber Grading Authority (NLGA) Species: Eastern Hemlock, Western Hemlock or Douglas Fir.
  - .2 Timber Treatment:
    - .1 All timber including utility poles to be treated with CCA (chromated copper arsenate) preservatives in accordance with CSA 080 Series 15, water borne salt preservative (24 kg/m<sup>3</sup>).
    - .2 Make arrangements for testing of timber by:
      - .1 Plant Inspection: Provide treatment plant identification, date of treatment, list of various pieces in the charge, charge number, plant assay testing results, concentration and type of preservative used, duration of treatment, gauge

retention, species of wood; and make arrangements with the treatment plant to locate bundles, move bundles, break open bundles and carry out other measures to facilitate the inspection.

- .2 Filling in and submitting a preprinted form, agreed to by the *Departmental Representative*, containing the above information.
- .3 Utility pole to be Jack Pine, to CSA 015, pressure or vacuum treated.
- .4 Pole class 4, 10.7 metres in length.

### PART 3 - EXECUTION

#### 3.1 General

- .1 Supply and install dimension timbers to details shown on drawings or as specified. Treated timber to be supplied in pre-cut lengths to suit.
- .2 Boreholes for drift bolts to be 1.5 mm smaller in diameter than bolt and for full length of bolt. Boreholes for machine bolts to be same diameter as bolts. Boreholes for lag bolts to be same diameter as shank for unthreaded portion and 0.70 times the shank diameter for the threaded portion. Threaded portion of lag bolts will be installed using a wrench, not by driving.
- .3 All countersunk holes to be recessed 25 mm from the head of the bolt and shall receive two coats of copper naphthenate, allowing sufficient time between applications to permit total absorption. The cost of supply and application of copper naphthenate will not be measured for payment but will be considered incidental to the work.



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Dimension Timber / Utility Poles

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- .4 Install utility poles as indicated and to utility standards.
- 3.2 Protecting Timber .1 Timber will be protected during handling, shipping, offloading and field handling, by use of suitable equipment and procedures. Use rope or fabric strap slings on site for moving bundles or individual timbers, rather than metal grabs, chains or steel cables.
- 3.3 Handling Treated Timber .1 Handle treated material to avoid damage causing alteration in original treatment.
- .2 Treat in field, spike holes, boreholes, plugged holes, cuts and any damage to treated material, using copper naphthenate, as specified herein, regardless of plant treatment type. Fill all unused bored holes and any other holes with tight fitting treated wooden plugs prior to any exposure to water containing marine borers.
- .3 Provide methodology pertaining to heating and application of field treatment. Apply to dry surfaces, wherever possible.
- .4 Treat boreholes, using a pressurized spray applicator with an extension rod, to produce a fine spray in the holes with one application. Alternately a cylindrical brush may be used.
- .5 Treat field cuts and any abrasions with minimum of two liberal applications of preservative, using either spray or brush.
- .6 Environmental Concern: Ensure no spillage or excess application of field preservative. Provide works with sufficient training and protective gear to properly and safely handle the treated materials and to apply field treatment, so as to prevent undue hazard to themselves,

others, or the environments.

- . 7 Contain all debris and leachates (films on water surface) within the area of the work by using containment facilities such as floating booms or screens.

-----END of SECTION-----

**Buoyancy Billets**

PART 1 - GENERAL

- 1.1 Reference Standards .1 All material shall be new, best quality and meet all CSA or other applicable performance standards.

PART 2 - PRODUCTS

- 2.1 Materials .1 Billets **moulded** from 3.8 mm (0.150") thick polyethylene resin (minimum wall thickness).  
.2 Billet filled with minimum 32 kgs/m<sup>3</sup> (2.0 lbs./ft<sup>3</sup>) closed cell high density flotation foam.  
.3 Billet completely seamless and sealed to prevent ingress of water.  
.4 Billet coating resistant to salt water, diluted concentrations of oil and grease, and ultra violet radiation.  
.5 Billet coating resilient to high abrasion, damage by animals, impact from handling, and chemicals.  
.6 Ambient temperature range: -35°C to 40° C.

PART 3 - EXECUTION

- 3.1 General .1 Supply and install billets to details shown on drawings or as specified.
- 3.2 Handling .1 Billets to be completely protected during handling, shipping, offloading and field handling, by use of suitable equipment and procedures.  
.2 Any damaged billets to be replaced by the Contractor.

-----END of SECTION-----

PART 1 - GENERAL

- 1.1 Description of Work .1 This Section includes but is not limited to the following:  
.1 All demolition and removals as required to complete the work in accordance with the plans and these specifications.
- 1.2 Related Work .1 Refer to other specification sections for related information.
- 1.3 Submissions .1 Methodology:  
.1 If requested by Departmental Representative, provide methodology for carrying out the work, provide submission in accordance with Section 01 33 00.
- 1.4 Protection .1 Prevent movement, settlement or damage of adjacent structures. Provided bracing and shoring as required. In event of damage, immediately replace such items or make repairs to approval of *Departmental Representative* and at no additional cost to *Departmental Representative*.  
.2 Prevent debris from going adrift and becoming a menace to navigation.  
.3 All damage to existing structures, roadways, pipelines, electrical systems not specified for removal to be repaired at the Contractor's cost to the satisfaction of the *Departmental Representative*.
- 1.5 Measurement for Payment .1 Sitework, demolition and removals will be measured in accordance with Section 01 29 00.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

- 3.1 Preparation
- .1 Inspect site and verify with *Departmental Representative* items designated for demolition and removal and items to be salvaged and preserved.
  - .2 Locate and protect utility lines. Preserve in operating condition active utilities traversing site.
- 3.2 Demolition and Removal
- .1 Demolish and remove all items as indicated on the plans and in these specifications including, but not limited to, the following items:
    - .1 Three (3) reinforced concrete abutments, in-situ excavated soil for the fabrication and installation of the cast in place concrete retaining wall and any timber foundation piles under the concrete abutments.
    - .2 Existing electrical system, except salvage items.
    - .3 Existing rip rap and overburden material, except rip rap to be salvaged and stockpiled for incorporation into the new work.
  - .2 Do not disturb adjacent structures designated to remain in place.
  - .3 At end of each day's work, leave work in safe condition so no part is in danger of toppling or falling.
- 3.3 Disposal of Material
- .1 Disposal of existing items include three (3) reinforced concrete abutments, in-situ excavated soil for the fabrication and installation of the cast in place concrete retaining wall and any timber foundation piles under the concrete abutments. Upon removal, all existing materials to be become the property of the contractor and must be removed from DFO property.

- .2 Upon removal of existing electrical system, all existing materials except for the (2) LED luminaires and treated timber utility pole to be become the property of the contractor and must be removed from DFO property. LED luminaires to be disconnected and unbolted from pole and turned over to the Harbour Authority along with the utility pole.
  - .3 All material to be transported and disposed of in an environmentally acceptable manner to the satisfaction of the *Departmental Representative*, and in accordance with any Provincial, Federal, or Municipal regulations or by-laws.
  - .4 Overburden material and unsuitable rip rap removed from existing slope is to be is to loaded, transported and placed into the containment cell located on the West side of the harbour as indicated on the plans.
- 3.4 Restoration
- .1 Upon completion of work, remove debris, trim surfaces and leave work site clean.
  - .2 Reinstate areas and existing works outside areas of demolition to conditions that existed prior to commencement of work. Match condition of adjacent, undisturbed areas.

-----END of SECTION-----

PART 1 - GENERAL

- 1.1 Description .1 This section specifies the requirements for the supplying, producing, placing, and compaction of Rock Fill and Granular Base (Type 1 Gravel) in accordance with the plans and this specification.
- 1.2 Related Sections .1 Section 01 29 00: Project Particulars and Measurement for Payment
- .2 Section 01 35 43: Environmental Protection Procedures for Marine Work.
- .3 Section 01 45 00: Testing and Quality Control
- 1.3 References .1 American Society for Testing and Materials (ASTM)
- .1 ASTM C117-04, Standard Test Method for Material Finer Than 0.075mm (No.200) Sieve in Mineral Aggregates by Washing.
- .2 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- .3 ASTM D422-63(2007), Standard Test Method for Particle-Size Analysis of Soils.
- .4 ASTM D698-07, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbs/ft<sup>3</sup>) (600kN-m/m<sup>3</sup>).
- .5 ASTM D4318-05, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
- .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

- 1.4 Source Sampling .1 Inform *Departmental Representative* of proposed source of materials and provide access for quarry inspection at least two weeks prior to commencing of work. Forward upon request a typical sample of rock to be used for test for approval.

PART 2 - PRODUCTS

- 2.1 Rock Fill .1 Rock Fill for Fill Against Concrete Structures shall be crushed and screened gravel or rock. It shall be approved by the Departmental Representative prior to utilization.
- .2 Rock fill will be of hard, durable, evenly graded blasted stone free from clay, friable materials, organic matter and other deleterious substances.
- .2 Use of shale rock or slate will not be permitted.
- .3 Fill Against Concrete Structures shall be tested in accordance with ASTM C 117 and C 136 and shall conform to the requirements as detailed below:

Gradation Requirements:

ASTM Sieve Size, $\mu\text{m}$	Percent Passing
112 000	100
40 000	60-85
5 000	25-50
315	5-15
80	2-7

Physical Properties:

Property	Test Method	FAS
LA Abrasion (Grading A)	ASTM C 131	45
Plasticity Index(1)	ASTM D 4318	$\leq 6$

(1) sand portion



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## Rock Fill and Granular Base

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2.2 Type I Gravel

- .1 Type 1 Gravel will consist of clean, hard, durable crushed gravel or stone, free from shale clay, friable materials, organic matter and other deleterious substances and graded within the following limits when tested to ASTM C136-84 and ASTM C117-87 and giving a smooth curve without sharp breaks when plotted on a semi-log chart.

ASTM

<u>Sieve Size, <math>\mu\text{m}</math></u>	<u>Percent Passing</u>
20 000	100
14 000	50-85
5 000	20-50
160	5-12
80	3-8

PART 3 - EXECUTION3.1 Rock Fill

- .1 Material will be placed uniformly across full cross-section in layers not exceeding 300mm loose depth.
- .2 Compact rock fill after each 300 mm lift with a 10 tonne (minimum) steel drum vibratory roller making a minimum of 6 passes. Compaction within 2 m of a structural member or wall face should be performed by static rolling only.

3.2 Type 1 Gravel

- .1 Place Type 1 gravel to lines, grades and dimensions indicated on drawings.
- .2 Do not place Type 1 gravel course until the rock fill has been accepted by the Department Representative.
- .3 Compact to grade with a 10 tonne (minimum) steel drum vibratory roller making a minimum of 6 passes. Compaction within 2 m of a structural member or wall face should be performed by static rolling only.

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- 3.3 Protection
  - .1 Maintain finished base in condition conforming to this section until succeeding material is applied or until acceptance by *Departmental Representative*.
  - .2 Take into account anticipated weather conditions and degree of exposure of site in setting requirements for protection.
  - .3 Schedule and carry out construction so that each phase of work is not left exposed longer than necessary.
  - .4 The Contractor should note that the work site is subject to water level variations due to tidal action. The Contractor should become familiar with tide tables for this area and tidal conditions at the site.
  
- 3.4 Cooperation and Assistance to Departmental Representative
  - .1 Co-operate with *Departmental Representative* on inspection of work and provide assistance requested.
  - .2 Upon request of *Departmental Representative*, furnish use of such boats, equipment, labour and materials as may be reasonably necessary to inspect and supervise Work.

-----END of SECTION-----

PART 1 - GENERAL

- 1.1 Description .1 This section specifies requirements for the supply and installation of synthetic non-woven geotextile (also referred to as filter fabric) to be used on the side slopes under the rip rap shore protection.
- 1.2 Related Works .1 Section 01 29 00: Project Particulars and Measurement for Payment
- .2 Section 31 37 10: Rip-Rap
- 1.3 References .1 ASTM International
- .1 ASTM A123/A123M-[09], Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .1 ASTM D4491-[99a(2009)], Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
- .2 ASTM D4595-[09], Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
- .3 ASTM D4716-[08], Standard Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
- .4 ASTM D4751-[04], Standard Test Method for Determining Apparent Opening Size of a Geotextile.
- .2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-4.2 No. 11.2-[2004], Textile Test Methods - Bursting Strength - Ball Burst Test (Extension of September 1989).
- .2 CAN/CGSB-148.1, Methods of Testing Geotextiles and Complete Geomembranes.

Geotextiles

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- .1 No.2-[M85], Methods of Testing Geosynthetics - Mass per Unit Area.
  - .2 No.3-[M85], Methods of Testing Geosynthetics - Thickness of Geotextiles.
  - .3 No.6.1-[93], Methods of Testing Geotextiles and Geomembranes - Bursting Strength of Geotextiles Under No Compressive Load.
  - .4 No.7.3-[92], Methods of Testing Geotextiles and Geomembranes - Grab Tensile Test for Geotextiles.
  - .5 No. 10-[94], Methods of Testing Geosynthetics - Geotextiles - Filtration Opening Size.
- .3 CSA International
- .1 CSA G40.20/G40.21-[04(R2009)], General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- 1.4 Samples .1 Submit to the *Departmental Representative* the following samples at least 2 weeks prior to commencing work: manufacturer's specifications on the geotextile proposed to be used.
- 1.5 Mill Certificates .1 Submit to *Departmental Representative* a copy of mill test data and certificate at least 2 weeks prior to start of work.
- 1.6 Storage and Delivery .1 Store, handle and protect geotextile in accordance with manufacturer's instructions and in such a manner that will not cause damage to material.
- 1.7 Waste Management and Disposal .1 Remove from site all packaging and excess materials for discarding at appropriate disposal/recycling facilities.

PART 2 - PRODUCTS

2.1 Materials

- .1 Geotextile to be synthetic fiber and be rot proof, unaffected by action of oil or salt water and not subject to attack by marine life, insects, or rodents.
- .2 Geotextile to be of non-woven construction supplied in rolls of minimum 3.0 metres width. The geotextile to have the following characteristics:
  - .1 Mass (g/m<sup>2</sup>) 210
  - .2 Grab tensile strength (N) 712
  - .3 Grab elongation (%) 50
  - .4 Tear resistance (N) 267
  - .5 CBR puncture (N) 1820
  - .6 Opening size (mm) 0.212
- .3 Securing pins and washers: to CAN/CSA-G40.21, Grade 300W, hot-dipped galvanized with minimum zinc coating of 600 g/m<sup>2</sup> to CAN/CSA G164.

PART 3 - EXECUTION

3.1 Installation

- .1 Place geotextile material by unrolling in orientation, manner and locations indicated and retain in position with securing pins and washers, weights or other method as approved by *Departmental Representative*.
- .2 Place geotextile material on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.
- .3 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.
- .4 Overlap each successive strip of geotextile minimum of 600 mm over

**Geotextiles**

previously laid strip.

- .5 Pin successive strips of geotextile with securing pins or fasteners as recommended by manufacturer.
- .6 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material.
- .7 Replace damaged or deteriorated geotextile to approval of *Departmental Representative*.

-----END of SECTION-----

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Rip-Rap

Page 1

**PART 1 - GENERAL**

- 1.1 Description .1 This section specifies the requirements for the removing, disposing, salvaging, stockpiling, producing, preparing slope, supplying and placing rip-rap in accordance with the plans and this specification.
- 1.2 Related Sections .1 Section 01 29 00: Project Particulars and Measurement for Payment
- .2 Section 01 35 43: Environmental Protection Procedures for Marine Work
- .3 Section 31 32 21: Geotextiles
- .4 Section 31 11 00: Sitework, Demolition and Removals

**PART 2 - PRODUCTS**

- 2.1 Rip Rap .1 New rip-rap shall be hard, durable, quarry stone, free from splits, seams or defects likely to impair its soundness during handling or by the actions of water and ice.
- .2 Rock is to be clean, durable free from mud, dirt, organic and other deleterious materials. It shall be approved by the *Departmental Representative* prior to utilization.
- .3 Shale, slate or rocks with thin foliations shall not be acceptable.
- .4 The greatest dimension of each rock shall not exceed two times the least dimension.
- .5 The minimum density of the rock to be 2.60 kgs/m<sup>3</sup>. Material to be well graded

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Rip-Rap

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ranging in size from 200 mm to 450 mm.

**PART 3 - EXECUTION**3.1 General

- .1 Remove all rip rap and salvage and stockpile suitable rip rap for later use. It is estimated that approximately 50 percent of the existing rip rap material can be salvaged and stockpiled on site for incorporation into the new Work.
- .3 All overburden material and unsuitable rip rap at the bottom of the slope to be excavated, removed, transported and disposed of in containment cell on West side of harbour as indicated on the plans. This material will not be measured but considered incidental to this item.
- .2 Shape side slope uniformly and install geotextile. Prepare toe in of the bottom of the slope as per construction drawings.

3.2 Placing Rip Rap

- .1 Place rip rap material starting at the toe of the new slope following the approval of placement of the geotextile by the *Departmental Representative*.
- .2 Place the rip-rap with an hydraulic excavator to the lines and grades shown on plan. The material that falls outside the work will be removed.
- .3 Pushing or end dumping material in place will not be permitted.
- .4 Place stone in manner approved by *Departmental Representative* to create a firm compacted, dense stable mass. Place larger stones at bottom of the slope.



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Rip-Rap

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- .5 Finish surface evenly, free of voids and neat in appearance.
- 3.3 Protection
  - .1 Maintain finished slope in condition conforming to this section until succeeding material is applied or until acceptance by *Departmental Representative*.
  - .2 Take into account anticipated weather conditions and degree of exposure of site in setting requirements for protection.
  - .3 Schedule and carry out construction so that each phase of work is not left exposed longer than necessary.
  - .4 The Contractor should note that the work site is subject to water level variations due to tidal action. The Contractor should become familiar with tide tables for this area and tidal conditions at the site.
- 3.3 Cooperation and Assistance to Departmental Representative
  - .1 Co-operate with *Departmental Representative* on inspection of work and provide assistance requested.
  - .2 Upon request of *Departmental Representative*, furnish use of such boats, equipment, labour and materials as may be reasonably necessary to inspect and supervise Work.

-----END of SECTION-----

PART 1 - GENERAL

- 1.1 Related Sections
- .1 Section 01 33 00: Submittal Procedures
  - .2 Section 31 62 19: Timber Piles
- 1.2 Submittals
- .1 Provide submittals in accordance with Section 01 33 00.
  - .2 Sub-surface investigation reports: when site conditions differ from those indicated, submit written notification to *Departmental Representative* and await further instructions.
  - .3 Submit schedule of planned sequence of driving to *Departmental Representative* for review, as specified.
  - .4 Equipment:
    - .1 Submit prior to pile installation for review by *Departmental Representative*, list and details of equipment for use in installation of piles.
    - .2 Impact hammers: submit manufacturer's written data as specified.
    - .3 Non-impact methods; submit characteristics to evaluate performance.
  - .5 Submit drivability analyses as specified, to *Departmental Representative* for approval of hammers.
- 1.3 Delivery, Storage and Handling
- .1 Deliver, store and handle materials in accordance with manufacturer's instructions.
  - .2 Protect piles from damage due to excessive bending stresses, impact, abrasion or other causes during delivery, storage, handling.

- .3 Replace damaged piles as directed by *Departmental Representative*.

PART 2 - PRODUCTS

2.1 General

- .1 Material requirements for piles are specified in Section 31 62 19.
- .2 Supply full length piles as indicated and provide equipment to handle full length piles without cutting or splicing.

2.2 Equipment

- .1 Impact hammers: provide manufacturer's name, type, rated energy per blow at normal working rate, mass of striking parts of hammer, mass of driving cap and type and elastic properties of hammer and pile cushions.
- .2 Non-impact methods of installation such as auguring (and/or rock socketing), jacking, vibratory hammers or other means: provide full details of characteristics necessary to evaluate performance.
- .3 Hammer:
  - .1 Hammers to be selected on basis of drivability analysis using wave equation theory, performed to show that all piles can be driven to levels indicated.
  - .2 Drivability analysis to include, but not be limited to, following: hammer, cushion, and cap block details; static soil parameters; quake and damping factors, total soil resistance, blow count, pile stresses and energy throughput at representative penetrations.
  - .3 When required criteria cannot be achieved with the proposed hammer, use larger hammer and take other measures as required.

- .4 Recommended rated hammer energy equal to 750 Joules multiplied by the pile tip diameter in centimeters.

PART 3 - EXECUTION

3.1 Preparation

- .1 Protection:
  - .1 Protect adjacent structures, services and work of other sections from hazards due to pile driving operations.
  - .2 Arrange sequencing of pile driving operations and methods to avoid damages to adjacent existing structures.
  - .3 When damages occur, remedy damaged items to restore to original or better condition at own expense.
- .2 Ensure that conditions at all pile locations are adequate to support pile driving operation. Make provision for access and support of piling equipment during performance of Work.

3.2 Installation

- .1 Leads: construct pile driver leads to provide free movement of hammer.
  - .1 Hold leads in position at top and bottom, with guides, stiff braces, or other means reviewed by *Departmental Representative*, to ensure support to the pile while being driven.
  - .2 Provide sufficient length of leads to ensure that use of follower is unnecessary.
  - .3 Swing leads are not permitted.
- .2 Installation of each pile will be subject to review of *Departmental Representative*.
  - .1 *Departmental Representative* will be the sole judge of acceptability of each pile with respect to final driving resistance, depth of

penetration or other criteria used to determine load capacity.

- .2 Pile capacities will be considered acceptable when the refusal criteria as detailed in the Geotechnical Report have been met. Refusal criteria is 5 blows per 25mm of pile penetration.
- .3 *Departmental Representative* to review final driving of all piles prior to removal of pile driving rig from site and prior to cutting the piles off. Final written authorization to proceed is required by the *Departmental Representative*.
- .4 Do not overdrive so as to cause damage to piles in bedrock.

3.3 Application / Driving

- .1 Use driving caps and cushions to protect piles.
  - .1 Reinforce pile heads as required by *Departmental Representative*.
  - .2 Piles with damaged heads as determined by *Departmental Representative* will be rejected.
- .2 Hold piles securely and accurately in position while driving.
- .3 Deliver hammer blows along axis of pile.
- .4 Ensure no contact between pile and existing structure takes place.
- .5 Re-strike already driven piles lifted during driving of adjacent piles to confirm set.
- .6 Cut off piles neatly and squarely at elevations as indicated to tolerance of plus or minus 5 mm.
  - .1 Provide sufficient length above cut-off elevation so that part damaged during driving is cut off.

- .7 Remove cut-off lengths from site on completion of work.
- 3.4 Obstructions
  - .1 Where an obstruction is encountered that causes sudden unexpected change in penetration resistance or deviation from specified tolerances, notify the *Departmental Representative* and await direction.
- 3.5 Field Quality Control
  - .1 Required Pile Testing:
    - .1 Each pile shall be driven to refusal.
    - .2 The depth to refusal of each pile shall be monitored and recorded by the Contractor to ensure piles are not obstructed during driving.
  - .2 Measurement:
    - .1 Maintain accurate records of driving for each pile, including:
      - .1 Types and make of hammer, stroke or related energy.
      - .2 Pile size and length, location of pile.
      - .3 Numbers of blows per meter for entire length of pile and number of blows per 25 mm for last 300 mm.
      - .4 Final tip and cut-off elevations.
      - .5 Record pertinent information such as interruption of continuous driving or pile damage.
      - .6 Record elevations taken on adjacent piles before and after driving of each pile.
  - .3 Records must be submitted to the *Departmental Representative* prior to receiving authorization to cut off piles.

PART 1 - GENERAL

- 1.1 Related Sections .1 Section 31 61 13: Pile Foundations  
General Requirements
- 1.2 Measurement Procedures .1 Refer to Section 01 29 00 for  
Measurement for Payment
- .2 Consider shoes, cap plates, straps and  
preservative treatment incidental to  
supply of piles.
- .3 *Departmental Representative* will  
establish actual number and lengths of  
piles installed from driving records.
- 1.3 References .1 American Society for Testing and  
Materials (ASTM)
- .1 ASTM A 123/A123M-01, Standard  
Specification for Zinc (Hot-Dip  
Galvanized) Coatings on Iron and  
Steel Products.
- .2 ASTM A 153/A153M-01, Standard  
Specification for Zinc Coating  
(Hot Dip) on Iron and Steel  
Hardware.
- .3 ASTM A 307-00, Specification for  
Carbon Steel Bolts and Studs,  
60,000 PSI Tensile.
- .2 Canadian Standards Association (CSA)
- .1 CSA B111-1974(R1998), Wire Nails,  
Spikes and Staples.
- .2 CAN/CSA-G164-M92(R1998), Hot Dip  
Galvanizing of Irregularly Shaped  
Articles.
- .3 CAN3-056-M79(R2001), Round Wood  
Piles (metric version).
- .4 CSA-080.18-97, Pressure Treated  
Piles and Timbers in Marine  
Construction.
- 1.4 Protection .1 Avoid dropping, bruising or breaking of  
wood fibers.

Timber Piles

- .2 Avoid breaking surfaces of treated piles.
- .3 Do not damage surfaces of treated piles below cutoff elevation.
- .4 Treat cuts, breaks or abrasions on surfaces of treated piles, bolt holes and field cuts in accordance with CSA-080.
- 1.5 Waste Management and Disposal
  - .1 Collect and separate for disposal packaging and other materials for recycling or disposal.
  - .2 Place materials defined as hazardous or toxic in designated containers
  - .3 Preservative-treated wood must not be disposed of through incineration.
  - .4 Preservative-treated wood must be separated from other materials destined for recycling or reuse.
  - .5 Dispose treated wood not for reuse including, end pieces, wood scraps, shavings, sawdust etc. at a provincially approved landfill.
  - .6 Dispose of unused wood preservative material at official hazardous material collections site.
  - .7 Unused wood preservative may not be disposed of into sewer system, into streams, lakes, onto ground or in any other location where they will pose a health or environmental hazard.

PART 2 - PRODUCTS

- 2.1 Materials
  - .1 Round wood piles: to CAN3-056, with maximum butt size of 330 mm and minimum tip diameter of 200 mm.



Timber Piles

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- .2 Pile species: Southern Yellow Pine or better.
- .3 Provide pre-fabricated steel pile driving shoe to prevent damage to the pile during driving.
- .4 Preservative Treatment: to CSA O80.18-M97 Pressure Treated Piles and Timbers in Marine Construction.
- .5 *Departmental Representative* will be the sole judge of quality and dimension of piles. Remove rejected piles from site of Work.
- .6 Wire nails, spikes, staples: to CSA B111.
- .7 Bolts, nuts and washers: to ASTM A 307 unless noted otherwise.
- .8 Hot dip galvanize bolts, nuts and washers and unless otherwise specified, staples, cable clamps, pipe sleeves, spikes and nails to ASTM A 153/A153M. Other hardware to be galvanized to ASTM A 123/A123M.

PART 3 - EXECUTION

3.1 Preparation

- .1 Select piles in the row for uniformity of size and straightness.
- .2 Submit details of proposed method of pile head and toe protection during driving to *Departmental Representative* for review.

3.2 Installation

- .1 Install piles in accordance with Section 31 61 13 - Pile Foundations, General Requirements.
- .2 During driving restrain lateral movement of piling at intervals not exceeding 5 meters over length between ground surface and driving head.

Timber Piles

- .3 Treat exposed ends of cut off piles with two liberally brushed coats of wood preservative treatment. Allow sufficient interval between applications to permit total absorption.
- .4 Protection: treat end cut-offs and bolt holes with preservative.
- 3.3 Tolerances
  - .1 If the location of the driven pile affects the reinforcing mat, adjust reinforcing as required. Any adjustments in reinforcing must be reviewed and approved by the *Departmental Representative*.
- 3.4 Pile Caps
  - .1 Not applicable.
- 3.5 Splices
  - .1 Not permitted.

-----END of SECTION-----

## Service Area Improvements

## New Floating Wharves Construction and Installation

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## Pre Cast Concrete Segmental Retaining Wall

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PART 1 - GENERAL

- 1.1 Related Requirements .1 Refer to other Specification Sections for related information.
- 1.2 Submittals .1 Submit in accordance with Section 01 33 00 - Submittal Procedures
- .2 Submit to *Departmental Representative* a complete set of drawings, 1 copy of detailed design calculations for review at least four (4) weeks prior to beginning construction. Drawings to indicate dimensions of concrete units, wall elevations, sections and grade profile.
- .1 Drawings and design calculations to be stamped and signed by professional engineer registered or licensed in the Province of Nova Scotia.
- .3 Manufacturer's Field Reports: Submit manufacturer's written reports within three (3) days of review, verifying compliance of Work, as described in PART 3 - Site Quality Control.
- 1.3 Delivery, Storage and Handling .1 Deliver, store and handle materials as per manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
- .1 Follow storage and handling recommendation of manufacturer.
- .2 Prevent chipping and cracking of precast concrete units.
- .3 Prevent staining or other defacement of front surfaces of precast concrete units during storage and handling.
- .4 Replace defective or damaged materials as directed by *Departmental*

*Representative.*

- .4 Waste Management and Disposal:
  - .1 Separate waste materials for recycling in accordance with Section 01 74 11 - Cleaning

PART 2 - PRODUCTS

- 2.1 Design Criteria
  - .1 Design codes:
    - CAN/CSA-S6-2014,
    - CAN/CSA-A23.1-14,
    - CAN/CSA-A23.2-14,
    - CAN/CSA-A23.3-14,
    - CAN/CSA-A23.4-1
  - .2 Consider both internal and external stability of wall system in design.
    - .1 Ensure external stability includes safety against sliding, overturning, bearing failure and slip circle failure.
- 2.2 Segmental Wall Units
  - .1 Ensure segmental retaining wall units come from single manufactured system
  - .2 Exterior dimensions of concrete units to be uniform and consistent. Maximum dimensional deviations shall be 3mm, not including textured face
  - .3 Exterior face texture and colour to be approved by *Departmental Representative*
- 2.3 Other Materials
  - .1 To specifications of contractor's designer of wall system.

PART 3 - EXECUTION

- 3.1 Examination
  - .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for retaining wall installation in accordance with manufacturer's written instructions.

## Service Area Improvements

## New Floating Wharves Construction and Installation

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## Pre Cast Concrete Segmental Retaining Wall

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- .1 Visually inspect substrate in presence of *Departmental Representative*.
- .2 Inform *Departmental Representative* of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from *Departmental Representative*.

3.2 Preparation

- .1 Temporary Erosion and Sediment Control:
  - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction
  - .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
  - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 Site Quality Control

- .1 Manufacturer's Field Services:
  1. Product installation to be completed as per manufacturer's design. Obtain and submit to *Departmental Representative* written reports from manufacturer verifying compliance of Work, in handling and installation.
  2. Submit manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

- 3.4 Allowable  
Tolerances
- .1 Finish top of wall or top of curb surfaces to within 25 mm of specified elevations and locations and within a tolerance of 12 mm for both the top and face of surfaces when measured under a 3 m long straightedge.

-----END of SECTION-----