

**NEW  
CONCRETE LAUNCHING RAMP CONSTRUCTION  
WALLACE, CUMBERLAND CO., N.S.**

**SPECIFICATION**

**JULY 2016**

This document is the document referred to as "Plans and Specifications" and marked "A" in the Articles of Agreement and includes the following:

"A"

**New Concrete Launching Ramp  
Wallace, Cumberland Co., N.S.**

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The enclosed drawings (plans) listed hereunder form part of the documents referred to as "Plans and Specifications" and marked "B" in the Articles of Agreement and consists of the following:

"B"  
**New Concrete Launching Ramp Construction**  
**Wallace, Cumberland Co., N.S.**  
**Project No. 721785**

List of Drawings

<u>Drawing No.</u>	<u>Title</u>
1 OF 2	Chart, Proposed Site Plan (Borehole Locations), Sections and Details
2 OF 2	Plan View of Concrete Launching Ramp, Profile, Sections and Details

END

General Instructions

1. 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
  
2. Site Conditions
  - .1 Records of existing structures and geotechnical reports may be available for inspection at the offices of Public Works And Government Services Canada, 1713 Bedford Row, Halifax, N.S. This material is not necessarily up to date and is for information purposes only. It should be complemented by site visits and consultation with appropriate expertise.
  
3. Work Schedule And Completion Dates
  - .1 The project is scheduled for completion by November 30, 2016.
  - .2 Prepare and submit to the *Departmental Representative* within [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; and intended man hours of labour and equipment for each major item of work. If the schedule as submitted is 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

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details and particulars thereto will not relieve the Contractor of any duties and responsibilities under the Contract.

4. Measurement Responsibilities
  - .1 Notify *Departmental Representative* sufficiently in advance of operations to permit required measurements for payment purposes.
  
5. Contractor's Use of Site
  - .1 Co-operate with users of existing facilities.
  - .2 Should interference's 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.
  
6. 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.

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7. Project Meetings .1 *Departmental Representative* will arrange project meetings and assume responsibility for setting times and recording and distributing minutes.
  
8. 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 be cause 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.
  
9. 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.
  
10. Contract Documents .1 The drawings for the Work consist of all drawings listed in these "Plans And Specifications" marked "A" and any

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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.
- .5 The following standard drawings form part of this specification:
  - .1 [Temporary conditions, signs and devices Standard Drawing 1502.]
  - .2 [Sign Support Detail Standard Drawing 1504].
- .6 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.

11. Permits and Regulations

- .1 Apply for, obtain and pay for all necessary permits, approvals and other authorizations required for the work.

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- .2 Comply with all by-laws, ordinances and regulations of all authorities having jurisdiction.
- .3 Pay for any Municipal permits, per General Conditions.
12. Cutting, Fitting and Patching
  - .1 Execute cutting (including excavation), fitting and patching required to make work fit properly.
  - .2 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.
  - .3 Where new work connects with existing and where existing work is altered, cut, patch and make good to match existing work.
  - .4 Obtain *Departmental Representative's* approval before cutting, boring or sleeving, or excavating adjacent to load-bearing members.
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.
  - .2 Provide "as built" cross sections of any excavation, dredging or fill work.
14. Payment
  - .1 Payment for all work under this contract to be according to the "Articles of Agreement".
  - .2 No separate payment will be made for work specified under General Conditions, Supplementary Conditions or any sections of Specification under Division 01. The cost of this work is to be considered as overhead and to be included in the unit prices of the Contract. [Exceptions are *Departmental Representative's* Site Office and Mobilization/Demobilization if shown separately in Unit Price Table.]
  - .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. Site Examination
  - .1 All parties tendering must visit the site of the work prior to submission of tenders and make themselves thoroughly



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- 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.
16. Maintenance of Shipping .1 Liaise with the local port officials to coordinate activities such that any interference is minimized.
17. 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.
18. 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.
19. 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. See General Conditions.
20. 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.

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21. 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.
22. Protection and  
Repair .1 Repair and damage resulting from operations under this contract.
23. Location of Equipment  
And Fixtures .1 Location of equipment, fixtures or any appurtenances indicated are to be considered approximate.
24. Inspection and  
Testing .1 The *Departmental Representative* may employ an Inspector and/or Testing Company to ensure work conforms with contract.
25. 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. 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.
26. Existing Soils  
Conditions .1 Any information pertaining to soils and all boreholes logs are furnished by the Departmental Representative as a matter of general information only and borehole descriptions or logs are not to be interpreted as descriptive of conditions at locations other than those described by the boreholes themselves.
27. 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.

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- .3 Relics, antiquities and items of historical or scientific interest remain her Majesty's property.
28. Temporary  
Navigational  
Buoys
- .1 The Contractor is to maintain temporary bouy's to mark the position of the outer end of the structure as construction proceeds. All bouy's are to meet the requirements of Canadian Coast Guard Standard TP968-1984 and be equipped with radar reflectors.
- .2 The Contractor shall coordinate the bouy 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 bouy's.

1.1 Submittals

- .1 Upon acceptance of bid and prior to commencement of work, submit to Departmental Representative the following work management documents:
  - .1 Work Schedule as specified herein.
  - .2 Shop Drawing Submittal Schedule specified in section 01 33 00.
  - .3 Hot Work Procedures specified in section 01 35 24.
  - .4 Health and Safety Plan specified in section 01 35 29.
  - .5 Environmental Plan specified in section 01 35 44.
  - .6 Waste Management Plan specified in section 01 74 21.
  - .7 Site Work Preparation and Removal section 02 41 13.

1.2 Work Schedule

- .1 Upon acceptance of bid submit:
  - .1 Work schedule within 7 calendar days of contract award.
  - .2 Schedule to indicate all calendar dates from commencement to completion of all work within the time stated in the accepted bid.
  - .3 Provide sufficient details in schedule to clearly illustrate entire implementation plan, depicting efficient coordination of tasks and resources, to achieve completion of work on time and permit effective monitoring of work progress in relation to established milestones.
- .2 Work schedule content to include as a minimum the following:
  - .1 Bar Charts, indicating all work activities, tasks and other project elements, their anticipated durations, planned dates for achieving key activities and major project milestones supported with;
  - .2 Written narrative on key elements of work illustrated in bar chart, providing sufficient details to demonstrate a reasonable implementation plan for completion of project within designated time.

- .3 Generally Bar Charts derived from commercially available computerized project management system are preferred but not mandatory.
  - .4 Work schedule must take into consideration and reflect the operational fishers.
  - .5 Schedule work in cooperation with the Departmental Representative and the Harbour Authority.
  - .6 Completed schedule shall be approved by Departmental Representative. When approved, take necessary measures to complete work within scheduled time. Do not change schedule without Departmental Representative's approval.
  - .7 Ensure that all sub trades and subcontractors are made aware of the work restraints and operational restrictions specified.
  - .8 Schedule Updates:
    - .1 Submit on a weekly basis.
    - .2 Provide information and pertinent details explaining reasons for necessary changes to implementation plan.
    - .3 Identify problem areas, anticipated delays, impact on schedule and proposed corrective measures to be taken.
  - .9 Departmental Representative will make interim reviews and evaluate progress of work based on approved schedule. Frequency of such reviews will be as decided by Departmental Representative. Address and take corrective measures on items identified by reviews and as directed by Departmental Representative. Update schedule accordingly.
  - .10 In every instance, change or deviation from the Work Schedule, no matter how minimal the risk or impact on safety or inconvenience to tenant or public might appear, will be subject to prior review and approval by the Departmental Representative.
- 1.3 Operational Restrictions .1 The Contractor must recognize that fishing activity and/or operations of the wharf will be affected by

implementation of this contract. The Contractor must perform the work with utmost regard to the safety and convenience of harbour operations, users and fish plant operation. All work activities must be planned and scheduled with this in mind.

- .2 Contractor to meet / consult with the Departmental Representative on a weekly basis to identify intended work areas, activities and scheduling for the coming week.
- .3 Facility circulation maintained:
  - .1 Ensure that access to wharf and other circulation routes are maintained free and clear providing safe and uninterrupted passage for Facility users and public at all times during the entire work.
  - .2 Maintain those areas clean and free of construction materials and equipment. Provide temporary dust barriers and other suitable enclosures to ensure users are not exposed to construction activities and are protected from exposure to dust, noise and hazardous conditions.
  - .3 The Contractor will be solely responsible for arranging the storage of materials on or off the site, and any materials stored at the site which interfere with any of the daily activities at or near the site will be moved promptly at the Contractor's expense upon the request by the Departmental Representative
  - .4 Maintain fire escape routes accessible and fire fighting access open all times for the duration of the project.
- .4 Safety Signage:
  - .1 Provide on site, and erect as required during progress of work, proper bilingual signage, mounted on self-supporting stands, warning the public and harbour users of construction activities in progress and alerting need to exercise caution in proceeding through disturbed areas of the facility.
  - .2 Signage to be professionally printed and mounted on wooden backing, coloured and to

express messages as directed by the  
Departmental Representative.

.3 Generally maximum size of sign should be in  
the order of 1.0 square meter. Number of signs  
required will be dependent on number of areas  
under renovation at any one time.

.4 Include costs for the supply and installation of  
these signs in the bid price.

### 1.5 Project Meetings

.1 Departmental Representative will arrange project  
meetings and assume responsibility for setting times  
and recording minutes.

.2 All project meetings will take place on site of work  
unless otherwise directed by the Departmental  
Representative.

.3 The Contractor's superintendent and sub-contractors  
are to be present at all project meetings.

.4 The superintendents of the sub-contractors are only  
required to be present at the project meetings during the  
phasing-in of their works.

### 1.6 Work Coordination

.1 The General Contractor is responsible for coordinating  
the work of the various trades and predetermining  
where the work of such trades interfaces with each  
other.

.2 Designate one person from own employ having overall  
responsibility to review contract documents and shop  
drawings, plan and manage such coordination.

.3 The General Contractor shall convene meetings  
between trades whose work interfaces and ensure that  
they are fully aware of the areas and the extent of where  
interfacing is required.

.4 Provide each trade with the plans and specs of the  
interfacing trade, as required, to assist them in planning  
and carrying out their respective work.

.5 Develop coordination drawings when deemed required  
illustrating potential interference between work of  
various trades and distribute to all affected parties  
including structural trade.

- .6 Review coordination drawings at purposely called meetings. Have subcontractors sign-off on drawings and publish minutes of each meeting.
- .7 Submit copy of coordination drawings and meeting minutes to Departmental Representative for information purposes.
- .8 Submission of shop drawings and ordering of prefabricated equipment or prebuilt components shall only occur once coordination meeting for such items has taken place between trades and all conditions affecting the work of the interfacing trades has been made known and accounted for.
- .9 Work Cooperation:
  - .1 Ensure cooperation between trades in order to facilitate the general progress of the work and avoid situations of spatial interference.
  - .2 Ensure that each trade provides all other trades reasonable opportunity for the completion of the work and in such a way as to prevent unnecessary delays, cutting, patching and the need to remove and replace completed work.
- .10 No extra costs to the Contract will be considered by the Departmental Representative as a result of Contractor's failure to effectively coordinate all portions of the Work. Disputes between the various trades as a result of their not being informed of the areas and extent of interface work shall be the sole responsibility of the General Contractor to be resolved at own cost.



## PROJECT PARTICULARS

1. Description of Work
  - .1 The work under this contract involves the removal and disposal of the existing asphalt ramp, the construction of berm and a concrete launching ramp. The work shall be completed in strict accordance with specifications and accompanying drawings and subject to all terms and conditions of contract.
  - .2 The contractor is responsible to coordinate their work with the local Harbour Authority including fishers.
  - .3 The work includes but is not limited to:
    - .1 Mobilization and demobilization.
    - .2 Site preparation (removals, excavation, slope preparation and grading).
    - .3 Load, supply & installation of approved clear stone.
    - .4 Load, supply & fabrication of reinforced concrete slabs.
    - .5 Installation of pre-cast reinforced concrete slabs.
    - .6 Load, supply, installation & compaction of approved type I gravel.
    - .7 Load, supply & installation of cast-in-place reinforced concrete slab.
    - .8 Load, supply and installation of approved berm (core) / granular material.
    - .9 Installation of filter fabric (supplied by DFO-SCH).
    - .10 Load, supply and installation of rip rap (shore protection).
    - .11 Load, supply, delivery and installation of new concrete catch basin.
    - .12 Load, supply, delivery and installation of new concrete storm sewer pipe.
    - .13 Load, supply, installation and compaction of approved Type I gravel.

## PROJECT MEASUREMENT

1. General
  - .1 This section details the measurement method to be used for payment purposes. Incidental items covered in the various sections of the Specification are to be allowed for in the pricing of each pay item.
2. Measurement For Payment
  - .1 Division 01000
    - .1 Mob and de-mob of equipment to and from the site will not be measured but paid Lump Sum.
    - .2 Site preparation including the removal of existing asphalt surface, rip rap, sub grade material to elevations and grades indicated on the construction drawings will not be measured but paid Lump Sum. Include in this item, all shaping, widening cross section and site work necessary to achieve grades prior to placing clear stone and type I gravels.
    - .3 Load, supply and installation of approved clear stone to lines and grades indicated will not be measured but paid Lump Sum. Locations to include clear stone, under the five (5) pre-cast concrete slabs and under the new concrete culvert as per note indicated on the construction drawings.
    - .4 Load, supply and fabrication of five (5) reinforced concrete slabs to dimensions indicated on the contract drawings. This item will be measured by the number of new units constructed as indicated on the contract drawings.

- .5 Installation of five (5) pre-cast reinforced concrete slabs to grades indicated on the attached construction drawings and (50mm) vertical tolerance indicated in the specifications. This item will not be measured but paid Lump Sum.
- .6 Load, supply, installation & compaction of approved type I gravel as to thicknesses and dimensions (footprint) indicated on the contract drawings will not be measured but paid Lump Sum. Include same thickness under the new catch basin.
- .7 Load, supply and installation of cast-in-place reinforced concrete slabs as to grades indicated on the contract drawings. This item will be measured by the cubic meter (m<sup>3</sup>) of reinforced concrete calculated from the dimensions indicated on the construction drawings.
- .8 Load, supply and installation of approved berm (core) / granular material to lines and grades indicated will be measured by the Cubic Meter Truck Measure (C.M.T.M.) incorporated into the work. Include material under new concrete culvert as per note #9 indicated on the construction drawings along with any material displaced as a result of the berm construction / weight is to be side casted into the containment berm
- .9 Installation of filter fabric to areas indicated on the construction drawings will not be measured but paid Lump Sum. Filter Fabric is located at Small Craft Harbours compound in Antigonish, contractor to load and deliver to site).
- .10 Load, supply and installation of rip rap (shore protection) to lines and grades indicated will be measured by the Cubic Meter Truck Measure (C.M.T.M.) incorporated into the work.
- .11 Load, supply, delivery and installation of new 1800mm Ø concrete catch basin. This item will not be measured but paid Lump Sum. Include in this item, a complete manhole along with concrete top, cast iron frame and cover. Exact location to be determined on site by SCH. Refer to sketch provided in specification – Precast Manholes, Catch Basins and Structures, section 33 39 00.
- .12 Load, supply and installation of new concrete 900mm Ø pipe. This item will be measured by the number new of units constructed as indicated on the contract drawings. Include in this item the cost to supply and install rubber gaskets at each seam. Refer to note #2 provided on sketch in specification – Precast Manholes, Catch Basins and Structures, section 33 39 00 (type of pipe, I.D.-O.D.).
- .13 Load, supply, installation & compaction of approved type I material to lines and grades indicated will be measured by the Cubic Meter Truck Measure (C.M.T.M.) incorporated into the work. Exact location to be determined on site by Departmental Representative.

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- 1.1 Related Sections
- .1 Section 01 78 00 - Closeout Submittals.
  - .2 Section 03 10 00 – Concrete Forming and Accessories.
  - .3 Section 03 30 00 – Cast-in-Place Concrete.
  - .4 Section 31 37 10 – Shore Protection (Rip Rap).
  - .5 Section 32 11 16 – Granular Base and Sub-Base Materials.
- 1.2 Submittal General Requirements
- .1 Submit to Departmental Representative for review requested submittals specified in various sections of the specifications including shop drawings, samples, permits, compliance certificates, test reports, work management plans and other data required as part of the work.
  - .2 Submit with reasonable promptness and in orderly sequence so as to allow for Departmental Representative's review and not cause delay in Work. Failure to submit in ample time will not be considered sufficient reason for an extension of Contract time and no claim for extension by reason of such default will be allowed.
  - .3 Do not proceed with work until relevant submissions have been reviewed.
  - .4 Present shop drawings, product data, samples and mock-ups in SI Metric units.
  - .5 Where items or information is not produced in SI Metric units, provide soft converted values.
  - .6 Review submittals prior to submission. Ensure that necessary requirements have been determined and verified 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.
  - .7 Verify field measurements and affected adjacent Work are coordinated.

- .8 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
  - .9 Contractor's responsibility for errors, omissions or 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 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, identify in writing of any revisions other than those requested.
  - .12 Keep one reviewed copy of each submittal document on site for duration of Work.
- 1.3 Shop Drawings and Product Data
- .1 The term "shop drawings" means fabrication drawings, erection drawings, diagrams, illustrations, schedules, performance charts, technical product data, brochures, specifications, test reports installation instructions and other data which are to be provided by Contractor to illustrate compliance with specified materials and details of a portion of work.
  - .2 Shop Drawing Quantities: submit sufficient copies required by the General Contractor and sub-contractors plus 4 copies which will be retained by Departmental Representative.
  - .3 Shop Drawing Format:
    - .1 Opaque white prints or photocopies of original drawings or standard drawings modified to clearly illustrate work specific to project requirements. Maximum sheet size to be 1000 x 707 mm.

- .2 Product Data from manufacturer's standard catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products, to be original full colour brochures, clearly marked indicating applicable data and deleting information not applicable to project.
- .3 Non or poorly legible drawings, photocopies or facsimiles will not be accepted and returned not reviewed.
- .4 Shop Drawing Content:
  - .1 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where items or equipment attach or connect to other items or equipment, confirm that all interrelated work have been coordinated, regardless of section or trade from which the adjacent work is being supplied and installed.
  - .2 Supplement manufacturer's standard drawings and literature with additional information to provide details applicable to project.
  - .3 Delete information not applicable to project on all submittals.
- .5 Allow 14 calendar days for Departmental Representative's review of each submission.
- .6 Adjustments or corrections made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, advise Departmental Representative in writing prior to proceeding with Work.
- .7 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections and comments are made, fabrication and installation may proceed upon receipt of shop drawings. If shop drawings are rejected and noted to be Resubmitted, do not proceed with that portion of work until resubmission and review of corrected shop drawings, through same submission procedures indicated above.

- .8 Be advised that costs and expenses incurred by Departmental Representative to conduct more than one review of incorrectly prepared shop drawing submittal for a particular material, equipment or component of work may be assessed against the Contractor in the form of a financial holdback to the Contract.
- .9 Accompany each submissions with transmittal letter, in duplicate, containing:
  - .1 Date.
  - .2 Project title and project number.
  - .3 Contractor's name and address.
  - .4 Identification and quantity of each shop drawing, product data and sample.
  - .5 Other pertinent data.
- .10 Submissions shall include:
  - .1 Date and revision dates.
  - .2 Project title and project number.
  - .3 Name and address of:
    - .1 Subcontractor.
    - .2 Supplier.
    - .3 Manufacturer.
    - .4 Contractor's stamp, signed by Contractor's authorized Representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
  - .5 Cross references to particular details of contract drawings and specifications section number for which shop drawing submission addresses.
  - .6 Details of appropriate portions of Work as applicable:
    - .1 Fabrication.
    - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
    - .3 Setting or erection details.
    - .4 Capacities.
    - .5 Performance characteristics.
    - .6 Standards.
    - .7 Operating weight.
    - .8 Wiring diagrams.

- .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.
  - .11 After Departmental Representative's review, distribute copies.
  - .12 The review of shop drawings by the Departmental Representative or by an authorized Consultant or designate is for sole purpose of ascertaining conformance with general concept. This review shall not mean that Canada approves the detail design inherent in the shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting all requirements of the construction and Contract Documents. Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of all sub-trades.
- 1.4 Samples
- .1 Submit for review samples as specified in respective specification Sections. Label samples with origin and intended use.
  - .2 Deliver samples to Departmental Representative's office or to other address as directed. Do not drop off samples at construction site except for pre-approved circumstances previously approved by Departmental Representative.
  - .3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.
  - .4 Where colour, pattern or texture is criterion, submit full range of samples.
  - .5 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments will result in a cost increase to the

Contract notify Departmental Representative in writing prior to proceeding with Work.

- .6 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.



- 1.1 Section Includes
- .1 Fire Safety Requirements.
  - .2 Hot Work Permit.
  - .3 Existing Fire Protection and Alarm Systems.
- 1.2 Related Work
- .1 Section 01 35 29 Health and Safety Requirements.
- 1.3 References
- .1 Fire Protection Standards issued by Fire Protection Services, Labour Program Division of Service Canada:
    - .1 FCC No. 301-June 1982 Standard for Construction Operations.
    - .2 FCC No. 302-June 1982 Standard for Welding and Cutting.
  - .2 FCC standards may be viewed at:
    - .1 <http://www.hrsdc.gc.ca/en/lp/lo/fp/standards/commissioner.html>
    - .2 Fire Protection Services - Atlantic Region office, Halifax, N.S, Tel. (902) 426-6053.
- 1.4 Definitions
- .1 Hot Work defined as:
    - .1 Welding work
    - .2 Cutting of materials by use of torch or other open flame devices
    - .3 Grinding with equipment, which produces sparks.
    - .4 Use of open flame torches such as for roofing work.
- 1.5 Submittals
- .1 Submit copy of Hot Work Procedures and sample of Hot Work permit to Departmental Representative for review, within 14 calendar days of acceptance of bid.
  - .2 Submit in accordance with section 01 33 00.
- 1.6 Fire Safety Requirements
- .1 Implement and follow fire safety measures during Work. Comply with following:
    - .1 National Fire Code.
    - .2 Fire Protection Standards FCC 301 and FCC 302.
    - .3 Federal and Provincial Occupational Health and Safety Acts and Regulations.
  - .2 In event of conflict between any provisions of above authorities the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, Departmental Representative will advise on the course of action to be followed.

- 1.8 Hot Work  
Procedures
- .1 Develop and implement safety procedures and work practises to be followed during the performance of Hot Work.
  - .2 Hot Work Procedures to include:
    - .1 Requirement to perform hazard assessment of site and immediate work area beforehand for each hot work event in accordance with Safety Plan specified in section 01 35 29.
    - .2 Use of a Hot Work Permit system with individually written permit issued by Contractor's Superintendent to specific worker or subcontractor granting permission to proceed with Hot Work.
    - .3 Permit required for each Hot Work event.
    - .4 Designation of a person on site as a Fire Safety Watcher responsible to conduct a fire safety watch for a minimum duration of 60 minutes immediately following the completion of the Hot Work.
    - .5 Compliance with fire safety codes, standards and occupational health and safety regulations specified.
    - .6 Site specific rules and procedures in force at the site as provided by the Facility Manager.
  - .3 Generic procedures, if used, must be edited and supplemented with pertinent information tailored to reflect specific project conditions. Label document as being the Hot Work Procedures for this contract.
  - .4 Procedures shall clearly establish responsibilities of:
    - .1 Worker performing hot work,
    - .2 Person issuing the Hot Work Permit,
    - .3 Fire Safety Watcher,
    - .4 Subcontractor(s) and Contractor.
  - .5 Brief all workers and subcontractors on Hot Work Procedures and of Permit system. Stringently enforce compliance.

- .6 Failure to comply with fire safety procedures may result in the issue of a Non-Compliance notification as specified in Section 01 35 29.

1.9 Hot Work Permit

- .1 Hot Work Permit to include the following:
  - .1 Project name and project number;
  - .2 Building name and specific room or area where hot work will be performed;
  - .3 Date of issue;
  - .4 Description of hot work type needed;
  - .5 Special precautions to be followed, including type of fire extinguisher needed;
  - .6 Name and signature of permit issuer.
  - .7 Name of worker to which the permit is issued.
  - .8 Permit validity period not to exceed 8 hours. Indicate start time/date and termination time/date.
  - .9 Worker's signature with time/date of hot work completion.
  - .10 Stipulated time period of safety watch.
  - .11 Fire Safety Watcher's signature with time/date.
- .2 Permit to be typewritten form. Industry Standard forms shall only be used if all data specified above is included on form.
- .3 Each Hot Work Permit to be completed in full, signed and returned to Contractor's Superintendent for safe keeping on site.

1.10 Documents on Site

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

- |                        |    |   |
|------------------------|----|---|
| <u>1.1 Section</u>     | .1 | Procedures to isolate and lockout includes electrical facility or other equipment from energy source.   |
| 1.2 Related Work       | .1 | Section 01 35 29: Health and Safety Requirements.   |
| <u>1.3 References</u>  | .1 | CSA C22.1-2002 - Canadian Electrical Code, Part 1, Safety Standard for Electrical Installations.  |
|                        | .2 | CSA C22.3 No. 1-M87 (R2001) - Overhead Systems.   |
|                        | .3 | CSA C22.3 No. 7-94 (R2000) - Underground Systems.   |
|                        | .4 | COSH, Canada Occupational Health and Safety Regulations made under Part II of the Canada Labour Code.   |
| <u>1.4 Definitions</u> | .1 | Electrical Facility: means any system, equipment, device, apparatus, wiring, conductor, assembly or part thereof that is used for the generation, transformation, transmission, distribution, storage, control, measurement or utilization of electrical energy, and that has an amperage and voltage that is dangerous to persons. |
|                        | .2 | Guarantee of Isolation: means a guarantee by a competent person in control or in charge that a particular facility or equipment is isolated.  |
|                        | .3 | De-energize: in the electrical sense, that a piece of equipment is isolated and grounded, e.g. if the equipment is hot grounded, it cannot be considered de-energized (DEAD).   |
|                        | .4 | Guarded: means that an equipment or facility is covered, shielded, fenced, enclosed, inaccessible by location, or otherwise protected in a manner that, to the extent that is reasonably practicable, will prevent or reduce danger to any person who might touch or go near such item.   |
|                        | .5 | Isolate: means that an electrical facility, mechanical equipment or machinery is separated or disconnected from every source of electrical, mechanical, hydraulic,  |

pneumatic or other kind of energy that is capable of making it dangerous.

- .6 Live/alive: means that an electrical facility produces, contains, stores or is electrically connected to a source of alternating or direct current of an amperage and voltage that is dangerous or contains any hydraulic, pneumatic or other kind of energy that is capable of making the facility dangerous to persons.

1.5 Compliance Requirements

- .1 Perform lockouts in compliance with :
  - .1 Canadian Electrical Code.
  - .2 Federal and Provincial Occupational Health and Safety Acts and Regulations as specified in section 01 35 29.
  - .3 Regulations and code of practice as applicable to mechanical equipment or other machinery being de-energized.
  - .4 Procedures specified herein.
- .2 In event of conflict between any provisions of above authorities the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, the Departmental Representative will advise on the course of action to be followed.

1.6 Submittals

- .1 Submit copy of proposed Lockout Procedures and sample of lockout tags for review.
- .2 Submit documentation within 7 calendar days of contract award. Do not proceed with work until submittal has been reviewed by the Departmental Representative.
- .3 Submit above documents in accordance with the submittal - general requirements specified in section 01 33 00.
- .4 Resubmit Lockout Procedures with noted revisions as may result from the Departmental Representative's review.

1.7 Isolation of Existing Services

- .1 Obtain the Departmental Representative's written authorization prior to conducting work on an existing

active, energized service or facility required as part of the work and before proceeding with lockout of such services or facility.

- .2 To obtain authorization, submit to the Departmental Representative following documentation:
  - .1 Written Request for Isolation of the service or facility and;
  - .2 Copy of Contractor's Lockout Procedures.
- .3 Make a Request for Isolation for each event, unless directed otherwise by the Departmental Representative, and as follows:
  - .1 Fill-out standard forms in current use at the Facility when so directed by the Departmental Representative or;
  - .2 Where no form exist at Facility, make request in writing identifying:
    - .1 Identification of system or equipment to be isolated, including it's location;
    - .2 Time duration, indicating Start time & date and Completion time & date when isolation will be in effect.
    - .3 Voltage of service feed to system or equipment being isolated.
    - .4 Name of person making the request.
- .4 Do not proceed until receipt of written notification from the Departmental Representative granting the Isolation Request and authorizing to proceed with the isolation of designated equipment or facility. The Departmental Representative may designate other individual at the Facility as the person authorized to grant the Isolation Request.
- .5 Conduct safe, orderly shut down of equipment or facilities, de-energize and isolate power and other sources of energy and lockout items in accordance with requirement of clause 1.8 below.
- .6 Determine in advance, as much as possible, in cooperation with the Departmental Representative, the type and frequency of situations which will require a Request for Isolation. Follow the Departmental Representative's directives in this regard.

1.8 Lockouts

- .7 Plan and schedule shut down of existing services in consultation with the Departmental Representative and the Facility Manager. Minimize impact and downtime of facility operations.
- .8 Conduct hazard assessment as part of the planning process of isolating existing equipment and facilities. Hazard Assessments to conform with requirements of Health and Safety Section 01 35 29.
- .1 De-energize, isolate and lockout electrical facility, mechanical equipment and machinery from all potential sources of energy prior to working on such items.
- .2 Develop and implement clear and specific lockout procedures to be followed as part of the Work.
- .3 Prepare typed written Lockout Procedures describing safe work practices, procedures, worker responsibilities and sequence of activities to be followed on site by work force to safely isolate an active piece of equipment or electrical facility and effectively lockout and tagout it's sources of energy.
- .4 Include as part of the Lockout Procedures a system of lockout permits managed by Contractor's Superintendent or other qualified person designated by him/her as being "in-charge" at the site.
  - .1 A lockout permit shall be issued to specific worker providing a Guarantee of Isolation before each event when work must be performed on a live equipment or electrical facility.
  - .2 Duties of .2 Duties of person managing the permit system to include:
    - .1 Issuance of permits and lockout tags to workers.
    - .2 Determining permit duration.
    - .3 Maintaining record of permits and tags issued.
    - .4 Making a Request for Isolation to Departmental Representative when required as specified above.
    - .5 Designating a Safety Watcher, when one is

- required based on type of work.
- .6 Ensuring equipment or facility has been properly isolated.
- .7 Collecting and safekeeping lockout tags returned by workers as a record of the event.

- .5 Clearly establish, describe and allocate responsibilities of:
  - .1 Workers.
  - .2 Person managing the lockout permit.
  - .3 Safety Watcher.
  - .4 Subcontractor(s) and General Contractor.
- .6 Generic procedures, if used, must be edited and supplemented with pertinent information to reflect specific project requirements.
  - .1 Clearly label the document as being the Lockout procedures applicable to work of this contract.
- .7 Use energy isolation lockout devices specifically designed and appropriate for type of facility or equipment being locked out.
- .8 Use industry standard lockout tags.
- .9 Provide appropriate safety grounding and guards as required.

#### 1.9 Conformance

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

#### 1.10 Documents

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



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

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 5 work days of notification of Bid Acceptance. Provide 3 copies.
  - .2 Departmental Representative will review Health and Safety Plan and provide comments.
  - .3 Revise the Plan as appropriate and resubmit within 5 work days after receipt of comments.
  - .4 Departmental Representative's review and comments made of the Plan shall not be construed as an endorsement, approval or implied warranty of any kind by Canada and does not reduce Contractor's overall responsibility for Occupational Health and Safety of the Work.

- .5 Submit revisions and updates made to the Plan during the course of Work.
  - .3 Submit name of designated Health & Safety Site Representative and support documentation specified in the Safety Plan.
  - .4 Submit building permit, compliance certificates and other permits obtained.
  - .5 Submit copy of Letter in Good Standing from Provincial Workers Compensation or other department of labour organization.
    - .1 Submit update of Letter of Good Standing whenever expiration date occurs during the period of Work.
  - .6 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
  - .7 Submit copies of incident reports.
  - .8 Submit WHMIS MSDS - Material Safety Data Sheets.
- 1.3 Compliance Requirements
- .1 Comply with Occupational Health and Safety Act for Province of New Brunswick, and General 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 to the Act.
    - .1 The Canada Labour Code can be viewed at:  
[www.http://laws.justice.gc.ca/en/L-2/](http://laws.justice.gc.ca/en/L-2/)
    - .2 COSH can be viewed at:  
[www.http://laws.justice.gc.ca/eng/SOR-86-304/n e .html](http://laws.justice.gc.ca/eng/SOR-86-304/n e .html)
    - .3 A copy may be obtained at: Canadian Government Publishing Public Works & Government Services Canada Ottawa, Ontario, K1A 0S9 Tel: (819) 956-4800 (1-800-635-7943) Publication No. L31-85/2000 E or F)
  - .3 Observe construction safety measures of:

- .1 Part 8 of National Building Code
- .2 Municipal by-laws and ordinances.
  
- .4 In case of conflict or discrepancy between above specified requirements, the more stringent shall apply.
  
- .5 Maintain Workers Compensation Coverage in good standing for duration of Contract. Provide proof of clearance through submission of Letter in Good Standing.
  
- .6 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.
  
  - .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. [See Section 01 50 00 for minimum acceptable requirements].

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

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

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

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

.5 Secure Work Site against entry when inactive or unoccupied and to protect persons against harm.

#### 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 Filling 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].
  - .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 Existing hazardous and controlled products stored on site:
      - .1 There are no hazardous and controlled products stored on site.
    - .2 Known latent site and environmental conditions:
      - .1 Work above water.
      - .2 Work under power lines.
      - .3 Rusty nails and metal fasteners.
      - .4 Exposure to the sea and storms.
      - .5 Seasonal conditions:
        - Winter.
          - .1 Expect cold weather, freezing rain and snow.
          - .2 Working surfaces, equipment and materials covered in ice.
          - .3 Ice in harbour.
          - .4 Hypothermia.
          - .5 Snow clearing equipment.
  - .3 Facility on-going operations:
    - .1 Harbour facility with on-going fishing related activities.
      - .1 Vessel movement.
      - .2 Loading and unloading on wharf.
      - .3 Fishers attending their vessels.
      - .4 Fish plant operation: Employees, transport trucks and auxiliary

- related plant operation.
        - .5 Public visiting the harbour facility.
      - .2 Dredging Operation. There is a potential that maintenance dredging may occur to provided adequate depth of water in the harbour entrance for navigation.
    - .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.
    - .4 MSDS Data sheets of pertinent hazardous and controlled products stored on site can be obtained from Departmental Representative.
- 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 Name, duties and responsibilities of persons designated as Emergency Warden(s) and deputies.
  - .3 Emergency Contacts: name and telephone number of officials from:
    - .1 General Contractor and subcontractors.
    - .2 Pertinent Federal and Provincial Departments and Authorities having jurisdiction.
    - .3 Local emergency resource organizations.
- .4 On-site Communication Plan:
- .1 Procedures for sharing of work related safety information to workers and subcontractors, including emergency and evacuation measures.
  - .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.



1.13 Safety Supervision

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

Record deficiencies and remedial action taken.

- .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.
- 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 \$5000.00.
  - .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 Blasting
  - .1 Not applicable.
- 1.20 Powder Actuated Devices
  - .1 Not applicable.
- 1.21 Confined Spaces
  - .1 Abide by occupational health and safety regulations regarding work in confined spaces.
- 1.22 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.
- 1.23 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.

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- 1.1 Related Work .1 Construction/Demolition Waste Management and Disposal: Section 01 74 21.
- 1.2 References .1 WHMIS: Workplace Hazardous Materials Information System, Health Canada.
- .2 Transportation of Dangerous Goods Act. Transport Canada, updated 2008-02-21.
- .3 Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters, Department of Fisheries and Oceans Canada, 1998.
- .4 MBCA: Migratory Birds Convention Act, Environment Canada, 1994.
- .5 Canadian Coast Guard Regulations, Department of Fisheries and Oceans Canada.
- .6 Canadian Shipping Act, Transport Canada, 2001.
- .7 AWWPA: American Wood Preserver Association.
- 1.3 Definitions .1 Hazardous Material: Product, substance, or organism that is used for its original purpose; and that is either dangerous goods or a material that may cause adverse impact to the environment or adversely affect health of persons, animals, or plant life when released into the environment.
- .2 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 or mineral soil areas that are influenced by excess water but produce little or no peat
- .3 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.
- .4 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.
- .5 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.
- 1.4 Transportation
- .1 Transport hazardous materials and hazardous waste in compliance with Federal Transportation of Dangerous Goods Act.
- .2 Do not overload trucks when hauling material. Secure contents against spillage.
- .3 Maintain trucks clean and free of mud, dirt and other foreign matter.
- .4 Avoid potential release of contents and of any foreign matter onto highways, roads and access routes used for the Work. Take extra care when hauling hazardous materials. Immediately clean any spillage and soils.
- .5 Before commencement of work, advise the Departmental Representative of the existing roads and temporary routes proposed to be used to access work areas and to haul material to and from the site.
- 1.5 Hazardous Material Handling
- .1 Handle and store hazardous materials on site in accordance with WHMIS procedures and requirements.
- .2 Store all hazardous liquids in location and manner to prevent their spillage into the environment.
- .3 Maintain written inventory of all hazardous materials kept on site. List product name, quantity and storage date.
- .4 Keep MSDS data sheets on site for all items.
- 1.6 Petroleum, Oil and Lubricants
- .1 Comply with Federal and Provincial laws, regulations, codes and guidelines for the storage of fuel and petroleum products on site.
- .2 Do not place fuel storage tanks and store fuel or other

petroleum products within a 30 metre buffer zone of watercourses and wetlands. Do not fuel or lubricate equipment within this 30 metre buffer zone. Obtain approval from Departmental Representative of acceptable location on site for fuel storage and equipment service.

- .3 Do not dump petroleum products or any other deleterious substances on ground or in the water.
- .4 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.
- .5 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.
- .6 Maintain vehicles and equipment in good working order to prevent leaks on site.
- .7 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 clean-up in accordance with all regulations and procedures stipulated by authority having jurisdiction.

1.7 Disposal of Wastes

- .1 Do not bury rubbish, demolition debris and waste materials on site.
- .2 Dispose and recycle demolition debris and waste materials in accordance with project waste management requirements specified in section 01 74 21.
- .3 Do not dispose of hazardous waste, volatile materials (such as mineral spirits, paints, thinners etc.) and petroleum products into waterways, storm or sanitary sewers or in waste landfill sites.
- .4 Dispose of hazardous waste in accordance with applicable federal and provincial laws, regulations, codes and guidelines.

- .5 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 Conduct dredging or excavation work of a watercourse or wetland in such a manner to limit turbidity and reduce sediment suspension in the water to an absolute minimum at all times.
  - .1 Maintain appropriate production speed and momentum of the dredging or excavation equipment. Make adjustments as required and as approved by Departmental Representative.
  - .2 Strategically position dredging or excavation equipment and barge or haul vehicles to avoid over the water swings of excavated material whenever possible.
- .2 Where work may affect the water quality adjacent to water intake lines used by Lobster Holding Facilities, Fish Processing Facilities and other harbour users, schedule work in cooperation with the Harbour Authority as directed by Departmental Representative to minimize interference and impact to harbour users.
- .3 Visually monitor the water turbidity of the surrounding areas adjacent to the work and up to the established dredge limit of 200 metres.
  - .1 Should excessive change occur in the turbidity beyond the dredge limit which differs from existing conditions of the surrounding water bodies, such as a distinct color difference; notify the Departmental Representative to obtain appropriate mitigation measures to be followed.
- .4 Do not wash down equipment within a 30 metre buffer zone of a wetland, watercourse or other identified



environmentally sensitive area.

1.9 Socioeconomic  
Restrictions

- .1 Abide by municipal and provincial regulations for any restrictions on work performed during the night time and on flood lighting of the site. Obtain applicable permits.
- .2 Place flood lights in opposite direction of adjacent residential and business areas.
- .3 Equipment and machinery with purposely designed mufflers to reduce noise on site to lowest possible level. Maintain mufflers in good operating condition at all times.

1.10 Bird and Habitat

- .1 Become knowledgeable with 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.

- 1.11 Fish and Fish Habitat
- .1 Be aware of the risk for contamination of the fish habitat at the site as a result of alien species being introduced in the water.
  - .2 To minimize the possibility of fish habitat contamination, all construction equipment which will be immersed into the water of a watercourse, or has the possibility of coming into contact with such water during the course of the work, must be cleaned and washed to ensure that they are free of marine growth and alien species.
    - .1 Equipment shall include boats, barges, cranes, excavators, haul trucks, pumps, pipe lines and other all miscellaneous tools and equipment previously used in a marine environment.
  - .3 Cleaning and washing of equipment shall be performed immediately upon their arrival at the site and before use in or over the body of water.
  - .4 Conduct cleaning and washing operations as follows:
    - .1 Scrap and remove heavy accumulation of mud and dispose appropriately.
    - .2 Wash all surfaces of equipment by use of a pressurized fresh water supply.
    - .3 Immediately follow with application of a heavy sprayed coating of undiluted vinegar or other environmentally approved cleaning agent to thoroughly remove all plant matter, animals and sediments.
    - .4 Check and remove all plant, animal and sediment matter from the all bilges and filters.
    - .5 Drain standing water from equipment and let fully dry before use.
    - .6 Upon removal from the water, drain standing water from equipment and let fully dry before removal off the site.
  - .5 Do not perform cleaning and wash down within a 30 metre buffer zone of a wetland, watercourse or other identified environmentally sensitive area.
  - .6 Record of Assurance Logbook:
    - .1 Maintain an on-going log of past and present usage and wash downs of all equipment to

illustrate mitigation measures undertaken against fish habitat contamination by alien species.

.2 Write data in a hard cover bound logbook,

.3 Include the following:

.1 Date and location where equipment was previously used in a watercourse or wetland;

.2 Type of work performed.

.3 Dates of wash down for each piece of equipment;

.4 Cleaning method and cleaning agent(s) used.

.7 Keep Record of Assurance Logbook updated from project to project. Upon request, submit logbook to Departmental Representative for review.

.8 Abide by requirements and recommendations of the Federal Department of Environment and the Department of Fisheries and Oceans - Habitat Protection and Sustainable Development Branch in cleaning and wash down of equipment.

#### 1.12 Air Quality

.1 Keep airborne dust and dirt resulting from the work on site to an absolute minimum.

.2 Apply dust control measures to roads, parking lots and work areas.

.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.

#### 1.13 Fires

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

1.1 Inspection

- .1 Give timely notice requesting inspection of Work designated for special tests, inspections or approvals by Departmental Representative or by inspection authorities having jurisdiction.
- .2 In accordance with the General Conditions, Departmental Representative may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents.
- .3 If Contractor covers or permits to be covered Work designated for special tests, inspections or approvals before such is made, uncover Work until particular inspections or tests have been fully and satisfactorily completed and until such time as Departmental Representative gives permission to proceed.
- .4 Pay costs to uncover and make good work disturbed by inspections and tests.

1.2 Testing

- .1 Tests on materials, equipment and building systems as specified in various sections of the Specifications is the responsibility of the Contractor except where stipulated otherwise.
  - .1 Provide all necessary instruments, equipment and qualified personnel to perform tests.
- .2 At completion of tests, turn over 2 sets of fully documented tests reports to the Departmental Representative. Submit in accordance with Section 01 33 00.
  - .1 Obtain additional copies for inclusion of a complete set in each of the maintenance manuals.
- .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 Relected 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.

- |   |    |   |
|---|----|---|
| <u>1.1 Site Access<br/>and Parking</u>          | .1 | The Departmental Representative will designate Contractor's access to project site as well as parking facilities for equipment and workers.   |
|   | .2 | Maintain existing roads and parking areas at site, where used by Contractor, for duration of contract.  |
|   | .1 | Keep clean and free of mud and dirt by washing on a regular basis.  |
|   | .2 | Provide snow removal in areas located within construction site or enclosed by work.   |
|   | .3 | Make good and repair damage resulting from Contractor's use of existing roads, asphalted areas and lawns on site.   |
| <u>1.2 Contractor's<br/>Site Office</u>         | .1 | Be responsible for and provide own site office, if required, including electricity, heat, lights and telephone. Locate site office as directed by Departmental Representative.                |
| <u>1.3 Material Storage</u>                     | .1 | Locate site storage trailers where directed by Departmental Representative. Place in location of least interference with existing Facility operations.  |
|   | .2 | Material storage space on site is limited. Coordinate delivery to minimize storage period on site before being needed for incorporation into work.  |
|   | .3 | Make arrangements elsewhere in the city as deemed required and pay all costs for storage of materials not ready for incorporation into work.  |
| <u>1.4 Site Enclosures</u>                      | .1 | Provide temporary fence to enclose various construction areas of work site.   |
|   | .2 | Provide warning signs affixed to all fenced areas, identifying those enclosed areas as "Construction Zones" with access restricted to only those persons so authorized by General Contractor. |
| <u>1.5 Pedestrian<br/>Walkways and Hoarding</u> | .1 | Ensure maximum safety and security to facility users during the course of work.   |
| <u>1.6 Sanitary<br/>Facilities</u>              | .1 | Provide sanitary facilities for work force in accordance with governing regulations and ordinances.   |

- .2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.
- 1.7 Power
  - .1 Arrange, pay for and maintain temporary electrical power supply in accordance with governing regulations and ordinances.
  - .2 Provide and maintain temporary lighting to conduct work. Ensure illumination level is not less than 162 lx in all locations.
- 1.8 Water Supply
  - .1 Arrange, pay for and maintain temporary water supply in accordance with governing regulations and ordinances.
- 1.9 Heating and Ventilation
  - .1 Supply, install and pay for costs of temporary heat and ventilation used during construction, including costs of installation, fuel, operation, maintenance and removal of equipment. Use of direct-fired heaters discharging waste products into work areas will not be permitted.
  - .2 Provide temporary heat and ventilation in enclosed areas as required to:
    - .1 Facilitate progress of work.
    - .2 Protect work and products against dampness and cold.
    - .3 Prevent moisture condensation on surfaces.
    - .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
    - .5 Provide adequate ventilation to meet health regulations for safe working environment.
  - .3 Maintain minimum temperature of 10 degrees C, or higher where specified, as soon as finishing work is commenced and maintain until acceptance of structure by Departmental Representative.
  - .4 Ventilating:
    - .1 Prevent accumulations of dust, fumes, mists, vapors or gases in areas occupied during construction.
    - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.

- .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
  - .4 Ventilate storage spaces containing hazardous or volatile materials.
  - .5 Ventilate temporary sanitary facilities.
  - .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.
- 1.10 Construction Sign and Notices
- .1 Upon request by Departmental Representative, erect a self supporting project sign in location indicated.
  - .2 Departmental Representative will provide a vinyl sign facing for installation by Contractor on sign framework. Sign frame to be plywood face of approximately 1200 x 2400 mm in size complete with required wood framing at 400 mm o.c and support posts.
  - .3 Install sign plumb and level in neat wood framework and securely anchor in ground by posts to withstand wind pressure of 160 km/h.
  - .4 Contractor or subcontractor advertisement signboards are not permitted on site.
  - .5 Safety and Instruction Signs and Notices:
    - .1 Signs and notices for safety and instruction shall be in both official languages or commonly understood graphic symbols conforming to CAN3-Z321-96(R2006).
  - .6 Maintenance and Disposal of Site Signs:
    - .1 Maintain approved signs and notices in good condition for duration of project and dispose of off site on completion of project or earlier if directed by Departmental Representative.
- 1.11 Removal of Temporary Facilities
- .1 Remove temporary facilities from site when directed by Departmental Representative.



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 7 days of request by *Engineer*:
    - .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.
2. Manufacturers Instructions
  - .1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.
  - .2 Notify *Engineer* in writing of any conflict between these specifications and manufacturers instructions. *Engineer* will designate which document is to be followed.
3. Fastenings-General
  - .1 All fastenings are to be the sizes indicated on the contract plans and are to be hot dipped galvanized to CSA-G164 Latest Edition unless otherwise noted.
4. 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.
  - .3 Store material and equipment in accordance with supplier's instructions.
5. Conformance
  - .1 When material or equipment is specified by standard or performance specifications, upon request of *Engineer*, obtain from manufacturer an independent testing laboratory report,

- 1.1 GENERAL
  - .1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
  - .2 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
  - .3 Prevent accumulations of wastes which create of each working day.
  - .4 Provide adequate ventilation during use of volatile or noxious substances.
- 1.2 MATERIALS
  - .1 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- 1.3 CLEANING DURING CONSTRUCTION
  - .1 Maintain project grounds and public properties in a tidy condition, free from accumulations of waste material and debris. Clean areas on a daily basis.
  - .2 Provide on-site garbage containers for collection of waste materials and debris.
  - .3 Remove waste materials, and debris from site on a daily basis.
- 1.4 FINAL CLEANING
  - .1 In preparation for acceptance of the Work performs final cleaning.
  - .2 Inspect finishes, fitments and equipment. Ensure specified workmanship and operation.
  - .3 Broom clean exterior paved and concrete surfaces; rake clean other surfaces of grounds.

END OF SECTION

Part 1            General

1.1                DISPOSAL OF WASTE

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

1.2 STORAGE AND HANDLING OF WASTE

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

Part 2 Not Used

Part 3 Execution

3.1 APPLICATION

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

3.2 CLEANING

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

3.3 DIVERSION OF MATERIALS

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

END OF SECTION

stating that material or equipment meets or exceeds specified requirements.

6.           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 *Engineer* 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 *Engineer* 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 *Engineer* and Contract price will be reduced accordingly. No substitutions will be permitted without prior written approval of *Engineer*.
    - .5 Owner reserves the right for acceptance or rejection of substitution of materials.
7.           Construction Equipment and Plant
- .1 On request, prove to the satisfaction of *Engineer* 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.
8.           Damaged and Rejected Materials
- .1 Immediately replace, repair or otherwise make good any material damaged, broken or defaced during construction to the satisfaction of *Engineer*.
  - .2 Remove rejected materials from site.

- 1.1 Section Includes
  - .1 Project Record Documents.
  - .2 Operations and Maintenance data.
- 1.2 Project Records Documents
  - .1 Departmental Representative will provide 2 white print sets of contract drawings and 2 copies of Specifications Manual specifically for "as-built" purposes.
  - .2 Maintain at site one set of the contract drawings and specifications to record actual as-built site conditions.
  - .3 Maintain up-to-date, real time as-built drawings and specifications in good condition and make available for inspection by the Departmental Representative upon request.
  - .4 As-Built Drawings:
    - .1 Record changes in red ink on the prints. Mark only on one set of prints and at completion of work, neatly transfer notations to second set (also by use of red ink).
    - .2 Submit both sets to Departmental Representative prior to application for Certificate of Substantial Performance.
    - .3 Stamp all drawings with "As-Built Drawings". Label and place Contractor's signature and date.
    - .4 Show all modifications, substitutions and deviations from what is shown on the contract drawings or in specifications.
    - .5 Record following information:
      - .1 Depths of various elements of foundation in relation to survey datum.
      - .2 Horizontal and vertical location of exterior underground utilities and appurtenances referenced to permanent surface improvements.
      - .3 Horizontal and vertical location of various elements in relation to Chart Datum;
      - .4 Field changes of dimension and detail;
      - .5 Location of all capped or terminated services and utilities;
      - .6 Chases for mechanical, electrical and other services;

- .7 All design elevations, sections, plans and details dimensioned and marked-up to consistently report finished installation conditions;
  - .8 Any details produced in the course of the contract by the Departmental Representative to supplement or to change existing design drawings;
  - .9 All change orders issued over the course of the contract must be documented on the finished as-built documents, accurately and consistently depicting the changed condition as it applies to all affected drawing details.
- .6 As-built Specifications: legibly mark in red each item to record actual construction, including:
- .1 Changes made by Addenda and Change Orders.
  - .2 Mark up both copies of specifications; stamp "as-built", sign and date similarly to drawings as per above clause.
- .5 Maintain As-built documents current as the contract progresses. Departmental Representative will conduct reviews and inspections of the documents on a regular basis. Failure to maintain as-built current and complete to satisfaction of the Departmental Representative shall be subject to financial penalties in the form of progress payment reductions and holdback assessments.

## PART 1 - GENERAL

- 1.1 Description
- .1 This section specifies requirements for the removal and temporary storage of materials to be reused in the work, reinstatement of materials to be reused and the disposal of construction waste materials at approved disposal sites. The work includes:
- .1 The removal of the asphalt layer, sub-base material and rip rap to the lines and grades shown on plan.
- .2 The salvaged sub base material and rip rap suitable for re-use can be stock piled on site. Location to be determined Departmental Representative.
- .3 The asphalt will become the property of the Contractor and is to be disposed of in approved environmental manner.
- 1.2 Related Work
- .1 Section 01 14 10: Scheduling and Managing New Work.
- .2 Section 01 35 44: Environmental Protection Procedures for Marine Work.
- .3 Section 01 74 21: Construction/Demolition Waste Management and Disposal.
- 1.3 Measurement Procedures
- .1 Site Preparation: Costs associated with the removal, temporary storage of materials to be reused, reinstallation of the material to be reused, including all labour, plant, equipment and necessary materials, will constitute a lump sum (LS) price.
- .2 There will not be any separate item for payment for the excavation and backfilling of material that interferes with the construction, such as, the sandy / silty material located on the Westside for berm construction and pipe installation. Include the cost for this work in that particular item.
- .3 Temporary Facilities: There will not be any separate item for payment for the provision and maintenance of temporary office for the Departmental Representative,



contractors on site office, equipment storage facility, portable toilets, etc. Include any cost for this work in section 01 29 00 for payment.

- .4 Barriers/Security Devices: There will not be any separate item for payment for the provision and maintenance of barriers and security devices. Include any cost for this work in section 01 29 00 for payment.

1.4 Definitions

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

PART 2 - PRODUCTS

NOT APPLICABLE

PART 3 - EXECUTION

3.1 Execution

- .1 Inspect site and verify with Departmental Representative materials and designated for removal.
- .2 Locate and protect utility lines and services. Preserve in operating condition active utilities traversing the site.

3.2 Removal

- .1 Remove in their entirety all materials and objects specified for removal.
- .2 Do not disturb adjacent work designated to remain in place.
- .3 Verify with Departmental Representative items to be reused in the work or turned over to the Harbour Authority.

3.3 Disposal of Material

- .1 All demolished materials, except materials designated to be reused or saved, will become property of Contractor and will be removed from site and disposed of as stated herein.

3.4 Storage

- .1 Obtain the Departmental Representatives approval for the use of storage space for the items to be reused in the work and for the temporary storage of items for disposal.

.2 Any re-usable material that is turned over to the Harbour Authority must be stored at an approved location.

3.5 Restoration

.1 Upon completion of work, remove debris, trim surfaces and leave work site in clean condition.

.2 Reinstate areas and existing works outside areas of demolition to conditions that existed prior to commencement of work.

## PART 1 - GENERAL

- 1.1 Related Sections .1 Section 03 30 00 Cast-in-Place 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 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 Submit shop drawings for formwork and falsework.
    - .1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of New Brunswick.
  - .3 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.
  - .4 Indicate formwork design data: permissible rate of concrete placement, and temperature of concrete, in forms.
  - .5 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-O121, CAN/CSA-O86 and CSA-O153.
  - .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 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.

## PART 1 - GENERAL

- 1.1 Related Work .1 Section 03 10 00: Concrete Forming and Accessories  
.2 Section 03 30 00: Cast-in-Place 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.
- 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 two (2) days' notice prior to pouring of concrete for scheduling of concrete testing.
  - .4 Ensure cover to reinforcement is maintained during concrete pour.

## PART 1 - GENERAL

- 1.1 Related Sections .1 Section 03 10 00: Concrete Forming and Accessories.  
.2 Section 03 20 00: Concrete Reinforcing.
- 1.2 Measurement Procedures .1 The pre-cast reinforced concrete slabs will be measured by the number of new units constructed as indicated on the contract drawings.  
.2 The cast-in-place reinforced concrete slabs will be measured for payment in cubic metres, (M<sup>3</sup>), calculated from theoretical neat dimensions indicated on plans or as authorized in writing by Departmental Representative.  
.3 Reinforcing steel will not be measured but considered incidental to the work.  
.4 Formwork and falsework will not be measured but considered incidental to the work.  
.5 No deductions will be made for volume of concrete displaced by reinforcing steel.  
.6 Heating of water and aggregates and providing cold weather protection will not be measured but considered incidental to work.  
.7 Cooling of concrete and providing hot weather protection will not be measured but considered incidental to work.  
.8 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 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 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 of any kind 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 HY150 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 Proportion normal density concrete in accordance with CAN/CSA-A23.1, Alternative 1, to give following properties:
  - .1 Cement: GUb-F/SF.
  - .2 Minimum compressive strength at 28 days: 35 MPa.
  - .3 Minimum cement content: 400 kg/m<sup>3</sup> of concrete.
  - .4 Maximum water/cement ratio: 0.40.
  - .5 Class of exposure: C-1.
  - .6 Nominal size of coarse aggregate: 20 mm.
  - .7 Slump at time and point of discharge: 50 to 100 mm.
  - .8 Air content: 5 to 8 %.

## PART 3 - EXECUTION

### 3.1 Preparation

- .1 Inform Department Representative before placing concrete. Provide 48 hours' notice prior to placing of concrete.
- .2 Pumping of concrete is permitted only after review of equipment and mix.
- .3 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .4 Prior to placing of concrete advise Departmental Representative of proposed method for protection of concrete during placing and curing in adverse weather.
- .5 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

- .6 Do not place load upon new concrete until authorized by Departmental Representative.
- 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 225 mm).
  - .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.
- 3.5 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 Deck:
      - .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 deck 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.

3.6 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.

3.7 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 take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.
- .3 Non-destructive Methods for Testing Concrete shall be in accordance with CAN/CSA-A23.2.

## PART 1 - GENERAL

- 1.1 Related Sections .1 Section 31 23 10: Excavating, Trenching and Backfilling.
- .2 Section 31 32 21: Geotextiles and Debris Containment Curtain.
- 1.2 Measurement Procedures .1 Shore Protection (Rip Rap): the will be measured in cubic metres truck measure, (CMTM), of material supplied and acceptably placed in the works to the lines and grades specified.

## PART 2 - PRODUCTS

- 2.1 Shore Protection .1 Shore protection is to be hard, dense with a specific gravity not less than 2.50 durable quarry stone, free from seams, cracks or other structural defects. Rock is to be clean, durable free from mud, dirt, organic and other deleterious materials. Material to be well graded ranging in size from 25kg to 50kg.
- .2 Sandstone will be accepted provided all criteria is meet.
- 2.2 Filter Fabric .1 Geotextile will be supplied by DFO -Small Craft Harbours.
- .2 Filter fabric is located in the Small Craft Harbours compound in Antigonish, contractor to deliver to site.

## PART 3 – EXECUTION

- 3.1 General .1 The Contractor shall place riprap material following the approval of the filter fabric.
- .2 The Contractor shall be responsible, at their expense to repair any such damage to the Work.
- 3.2 Filter Fabric 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 smooth and free of tension stress, folds, wrinkles and creases.
- .3 Overlap each successive strip of geotextile minimum of 600 mm over previously laid strip.
- .4 Pin successive strips of geotextile with securing pins or fasteners as recommended by manufacturer.
- .5 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material.
- .6 Cover with overlying layer within 4 hrs of placement of the geotextile material.
- .7 Replace damaged or deteriorated geotextile to approval of Departmental Representative.

### 3.2 Placing Rip Rap

- .1 Place the rip rap to the lines and grades shown on plan. The material that falls outside the work are will be removed.
- .2 Shore protection to be placed with a hydraulic excavator.
- .3 Pushing or dumping material in place will not be permitted.
- .4 Place stone in manner approved by Departmental Representative to create a firm compacted, very dense stable mass. Place larger stones at bottom. Top of stone fill to be of finer gradation suitable to receive filter fabric and granular sub-base.
- .5 Finish surface evenly, free of loose areas and neat in appearance



PART 1 - GENERAL

- 1.1 Source Sampling .1 Inform Departmental Representative (DR) 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 gravel to be used for test for approval. Sample of gravel to be between 10 - 40 kgs. and representative of all rock to be used in the work. The sample is to be provided during quarry inspection by DR.
- 1.2 Haul & Access Roads .1 Construct and maintain haul roads at Contractor's expense.
- 1.3 Measurements Procedures .1 Granular (Core) Material: will be measured for payment by the cubic meters truck measure (CMTM) of material supplied and acceptably placed in the works to the lines and grades specified.
- .2 Sub-Base Material (Clear Stone / Type I gravel): will not be measured but paid Lump Sum (LS). Refer to section 01 29 00 for more detail.

PART 2 - PRODUCTS

- 2.1 Granular (Core) Material .1 Granular (core) berm material to be pit run or quarried material that is rough and angular in shape requiring approval by Departmental Representative.
- .2 Material to be hard, durable, angular particles, free from clay lumps, cementation, organic material, frozen material, deleterious materials and containing minimal fines.
- .3 Gradation is to be within limits specified by the following

<u>SIZE</u>	<u>% PASSING (by weight)</u>
(200 mm) 8"	100
(100 mm) 4"	80
(50 mm) 2"	50
(25 mm) 1"	30
(12 mm) ½"	15
(6 mm) ¼"	10
(3 mm) 0 ⅛"	5

2.2 Clear Stone .1 Approved sub-base material (clear stone) will consist of 1/8" (2.5mm) to 1" (25mm) stone. It will be hard, durable, angular particles, free from clay lumps, cementation and organic material.

.3 Gradation is to be within limits specified by the following

<u>SIZE</u>		<u>% PASSING (by weight)</u>
(25 mm)	1"	100
(19 mm)	3/4"	80
(12 mm)	1/2"	50
(6 mm)	1/4"	30
(3 mm)	1/8"	15

2.3 Type I Gravel .1 Approved sub-base (type I) material will consist crushed and screened rock or gravel. It will be hard, durable, angular particles, free from clay lumps, cementation and organic material.

.3 Gradation is to be within limits specified by the following (NSTIR approved):

<u>SIZE (µm)</u>		<u>% PASSING (by weight)</u>
(20 000)	3/4"	100
(14 000)	1/2"	50 - 80
(5 000)	1/4"	20 - 50
(1 250)		
( 160)		5 - 12
( 80)		3 - 8

### PART 3 - EXECUTION

3.1 Inspection of Subgrade Surface .1 Do not place clear stone or type I gravel until sub-grade is inspected and approved.

3.2 Granular (Core) Material .1 Place the core material to lines, grades and dimensions indicated.

.2 Core material may be placed by end dumping.

- .3 Core material placed outside of the lines or grades will be realigned at no additional cost.
- .4 Any existing mud flat / insitu material displaced (pushed forward) on basin side as the result of core material placement shall be removed at the contractor expense. This material is to be placed into berm area during the construction of the causeway.
- .5 Place granular sub-base materials using methods which do not lead to segregation or degradation.
- .6 Shape berm / causeway to smooth grade and compact using to leveling equipment and trucks.

3.3 Clear Stone

- .1 Place the clear stone to lines, grades and dimensions indicated for the bottom five (5) pre-cast concrete slabs.
- .2 Material may be placed by end dumping.
- .3 The material placed beyond the lines and grades specified will not be measured for payment.
- .4 Clear stone should be hand raked into place as tolerance for concrete slab grade is 50mm.

3.4 Type I Gravel

- .1 Place the type I gravel to lines, grades and dimensions indicated for the remaining 21 plus meters bottom five (5) pre-cast concrete slabs.
- .2 Type I gravel may be placed by end dumping. Level, place and compaction of type I gravel using methods which do not lead to segregation or degradation
- .3 The material placed beyond the lines and grades specified will not be measured for payment.
- .4 Compaction equipment must be capable of obtaining required densities in materials.

3.5 Protection

- .1 Take into account anticipated weather conditions and degree of exposure of site in setting requirements for protection.
- .2 Schedule and carry out construction so that each phase of work is not left exposed longer than necessary.
- .3 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 behavior at the site.

PART 1 - GENERAL

- 1.1 Work Included .1 This section specifies requirements for constructing precast concrete manholes, catchbasins and structures. Work includes supply and installation of concrete bases, precast sections, metal castings and testing.
- 1.2 Related Sections .1 Concrete Section 03 30 00  
.2 Storm Sewers and Culverts Section 33 40 00
- 1.3 Reference Standards .1 ASTM A48/A48M-03(R2008), Gray Iron Castings.  
.2 ASTM C478M-08, Precast Reinforced Concrete Manhole Sections (Metric)  
.3 CAN/CSA A257 Series-03, Standards for Concrete Pipe and Manhole Sections.  
.4 CAN/ULC S701-05, Thermal Insulation, Polystyrene Boards and Pipe Covering
- 1.4 Shop Drawings .1 Submit shop drawings in accordance with Section 01 10 00 for items listed in Supplementary Specifications.
- 1.5 Handling and Storage .1 Prevent damage to materials during storage and handling.  
.2 Store gaskets in cool location out of direct sunlight, and away from petroleum products.
- PART 2 - PRODUCTS
- 2.1 General .1 1800mm Diameter manhole

- |                                       |    |  |
|---------------------------------------|----|--|
| <u>2.2 Precast Bases and Sections</u> | .1 | Precast Concrete Bases and Sections: to ASTM C478M or CSA A257.  |
| <u>2.3 Gaskets</u>                    | .1 | O-Rings: to manufacturer's standard.   |
|                                       | .2 | Bituminous Compound: precast manufacturer's recommended compound.  |
| <u>2.4 Metal Castings</u>             | .1 | Frames, covers and gratings: to ASTM A48, gray cast iron, factory coated.  |
| <u>2.5 Waterproofing</u>              | .1 | Waterproofing: type specified in Supplementary Specification.  |
| <u>2.6 Insulation</u>                 | .1 | Rigid Insulation: to CAN/ULC S701, Type 4, polystyrene.  |
| <u>2.7 Concrete</u>                   | .1 | Cast-in-place base and grade adjustment: to Section 03 30 00, min. 35 MPa at 28 days, air entrained, 50 mm slump, Water/cement ratio: 0.45 maximum.        |
|                                       | .2 | Grade Adjustment: manufactured type or cast-in-place type as indicated.  |
| <u>2.8 Non-Shrink Grout</u>           | .1 | Pre-mixed, dry pack or pourable type containing non-metallic aggregate, plasticizing agents and cement, minimum compressive strength of 45 MPa at 28 days. |
| <br><u>PART 3 - EXECUTION</u>         |    |  |
| <u>3.1 Preparation</u>                | .1 | Carefully inspect products for defects and remove defective products from site.  |
| <u>3.2 Excavation and Backfill</u>    | .1 | Do excavating and backfilling to Section 31 20 00.   |
| <u>3.3 Installation</u>               | .1 | Construct units as indicated.  |
|                                       | .2 | Complete units as pipe laying progresses.  |

- .3 Cast or set base on 150 mm thick pipe bedding or material as indicated in the Project Documents compacted to 95% Standard Proctor Density or as indicated. Top of base to be level.
- .4 Place stubs at elevations and in positions indicated. Provide flexible pipe joints within 1 metre of outside face of poured-in-place and precast structure where there is no in-wall gasket for pipe sizes up to and including 750 mm diameter.
- .5 Form manhole bases to provide smooth U-shaped channels with depth equal to diameter of pipes or as indicated. Curve channels smoothly and slope uniformly from inlet to outlet. Benching to drain towards channel, 4% maximum slope.
- .6 Install base section of precast shafting on cast-in-place base as indicated and assure watertight joint.
- .7 Install gaskets in accordance with manufacturer's published instructions.
- .8 Install precast sections plumb and true with opening centered over upstream pipe.
- .9 Make all joints watertight in sanitary sewer manholes and valve chambers.
- .10 Install ladder if required by Project Documents.
- .11 Set frame and cover or grating to elevation and slope indicated. Use cast-in-place concrete for adjustment and secure frame in place with cement grout or use manufactured type.
- .12 Clean debris and foreign material from unit. Remove fins and sharp projections. Prevent debris from entering system.

#### 3.4 Installation in Existing System

- .1 Installing units in existing systems:
  - .1 Where new unit is to be installed in existing run of pipe, ensure full support of existing pipe during installation, and carefully remove that portion of existing pipe to dimensions required and install new unit as specified.
  - .2 Make joints watertight between new unit and existing pipe.
  - .3 Where deemed expedient to maintain service around existing pipes and when systems constructed under this project are ready to be put in operation, complete installation with appropriate break-outs, removals, redirection of

flows, blocking unused pipes or other necessary work.

3.5 Adjusting Tops  
Of Existing Units

- .1 Remove existing gratings, frames and store for re-use at locations designated by Engineer.
- .2 Sectional units:
  - .1 Raise or lower straight walled sectional units by adding or removing precast sections as required.
  - .2 Raise or lower tapered units by removing cone section, adding, removing, or substituting riser sections to obtain required elevation, then replace cone section. When amount of raise is less than 600 mm use standard modoloc or grade rings.
- .3 Monolithic units:
  - .1 Raise monolithic units by roughening existing top to ensure proper bond and extend to required elevation.
  - .2 Lower monolithic units with straight wall by removing concrete to elevation indicated for rebuilding.
  - .3 When monolithic units with tapered upper section are to be lowered more than 150 mm, remove concrete for entire depth of taper plus as much straight wall as necessary, then rebuild upper section to required elevation with cast-in-place concrete.
  - .4 Install additional manhole ladder rungs in adjusted portion of units as required.
  - .5 Re-use existing gratings, frames as directed by the Engineer.
  - .6 Re-set gratings and frames to required elevation on full bed of cement mortar, parge and trowel smooth.

3.6 Sealing over  
Existing Units

- .1 Fill with cast-in-place concrete approved by Engineer.

3.7 Testing

- .1 Test sanitary sewer manholes and structures.
- .2 Provide labour, equipment and materials required to perform testing.
- .3 Backfill prior to testing.
- .4 Notify Engineer 24 hours in advance of proposed test. Do test in presence of Engineer.
- .5 Test method: as indicated and in accordance with the authority having jurisdiction.



- .6 Water testing: perform test as follows:
  - .1 If water used for flushing or testing is obtained from a potable water supply, the potable water supply is to be continuously separated from the service being flushed or tested by an air gap or a level of protection equal to or greater than that provided by a double check valve backflow prevention device.
  - .2 Plug all inlet and outlet pipes with watertight plugs.
  - .3 Fill with water to top of precast sections.
  - .4 Allow time for initial absorption.
  - .5 Measure and record volume of water required to maintain level for one hour.
  - .6 Leakage not to exceed 5.0 litres per hour per 1000 mm diameter per 1000 mm of height above groundwater.
  - .7 Locate and repair defects if test fails. Retest using same methodology.
  - .8 Repair leaks regardless of test results.
  
- .7 Vacuum testing: perform test as follows:
  - .1 Plug all inlet and outlet pipes. Restrain plugs.
  - .2 Place and seal vacuum tester head on the manhole frame.
  - .3 Draw vacuum of 250 mm Hg on the manhole and measure the time for the vacuum to drop to 225 mm Hg.
  - .4 Time to be not less than 45, 50, 65, and 80 seconds for manhole diameters of 1050 mm, 1200 mm, 1500 mm, and 1800 mm respectively.
  - .5 For manholes deeper than 6 meters, increase test times by 2 seconds per 300 mm of additional manhole depth.
  - .6 Locate and repair defects if test fails. Retest using same methodology.
  - .7 Repair leaks regardless of test results.

PART 1 - GENERAL

- 1.1 Work Included .1 This section specifies requirements for constructing storm sewers and culverts. Work includes supply and installation of pipe, fittings and service connections.
- 1.2 Related Sections .1 Concrete Section 03 30 00
- .2 Precast Manholes, Catch Basins and Structures Section 33 39 00
- 1.3 Reference Standards .1 ASTM C14M-07, Concrete Sewer, Storm Drain, and Culvert Pipe (Metric).
- .2 ASTM C76M-08a, Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe (Metric).
- .3 ASTM D1056-07, Flexible Cellular Materials - Sponge or Expanded Rubber.
- .4 CSA-G401-M-07, Corrugated Steel Pipe Products.
- .5 CAN/CSA A257 Series-03, Standards for Concrete Pipe and Manhole Sections.
- .6 CAN/CSA B1800 Series-06, Thermoplastic Non-Pressure Piping Compendium.
- 1.4 Certificates .1 Upon request, submit manufacturers' test data and certification that products and materials meet requirements of this Section in accordance with Section 01 10 00 for items listed in Supplementary Specifications.
- 1.5 Handling and Storage .1 Handle and store pipe and fittings in such a manner as to avoid shock and damage. Do not use chains or cables passed through pipe bore.
- .2 Store gaskets in cool location, out of direct sunlight, and away from petroleum products.

PART 2 - PRODUCTS

- 2.1 General .1 Diameter, material, strength class and dimensional ratio of pipe and fittings: as indicated.
- 2.2 Concrete Pipe and Fittings .1 Pipe and Fittings:  
.1 Non-reinforced: to ASTM C 14M or CAN/CSA A257.1.  
.2 Reinforced: to ASTM C 76M or CAN/CSA A257.2.  
.2 Joints: bell and spigot with flexible rubber gaskets to CAN/CSA A257.3-M.
- 2.3 Plastic Pipe and Fittings .1 Type PSM Polyvinyl Chloride:  
.1 For diameter 150 mm and under: CAN/CSA B1800.  
.2 For diameter 200 mm and over: CAN/CSA B1800.  
.2 Profile PVC sewer pipe and fittings: to CAN/CSA B1800, profile as indicated in Project Documents.  
.3 Joints: bell and spigot with locked-in rubber gasket.
- 2.4 HDPE Pipe and Fittings .1 Double walled HDPE: to CAN/CSA B1800 with smooth interior surfaces.  
.2 Fittings: welded or bell and gasket as indicated.
- 2.5 Corrugated Steel Pipe and Couplers .1 Pipe and Couplers: to CAN3-G401-M galvanized.  
.1 Gaskets: to ASTM D1056.
- 2.6 Service Saddles .1 Concrete main: cast-iron or PVC with gasket, all stainless steel strap, or bolt on, and O-ring in branch end.  
.2 PVC main: in-line tee or wye or PVC strap-on saddle, with gasket, all stainless steel clamps and O-ring in branch end.  
.3 Corrugated steel pipe: prefabricated corrugated steel saddle as specified for corrugated steel pipe.
- 2.7 Marker Stakes .1 Timber, 40 mm x 90 mm.

2.8 Grout .1 Non-shrink: to Section 03 30 00.

PART 3 - EXECUTION

3.1 Preparation .1 Carefully inspect products for defects and remove defective products from site.  
.2 Ensure that pipe and fittings are clean before installation.

3.2 Trenching, Bedding and Backfilling .1 Do trenching, bedding and backfilling to Section 31 20 00.

3.3 Pipe Installation .1 Lay and joint pipe and fittings as specified herein and according to manufacturer's published instructions.  
.2 Lay pipe and fittings on prepared bed, true to line and grade indicated within following tolerances:  
Horizontal Alignment: 50 mm.  
Vertical Alignment: the lesser of 13 mm or one half the rise per pipe length.  
.3 Commence laying at outlet and proceed in upstream direction with bell ends facing upgrade.  
.4 Prevent entry of bedding material, water or other foreign matter into pipe. Use temporary watertight bulkheads when pipelaying is not in progress.  
.5 Install gaskets in accordance with manufacturer's published instructions. During cold weather, store gaskets in heated area to assure flexibility.  
.6 Align pipe carefully before joining. Do not use excessive force to join pipe sections.  
.7 Support pipes as required to assure concentricity until joint is properly completed.  
.8 Keep pipe joints free from mud, silt, gravel or other foreign material.  
.9 Avoid displacing gasket or contaminating with dirt, petroleum products, or other foreign material. Remove, clean, reinstall and lubricate gaskets so disturbed.  
.10 Complete each joint before laying next length of pipe.