



Department of Fisheries and Oceans

Structure #401 Rehabilitation

Skidders Pond Harbour
Prince County, PE
Project No.

0	Issued For Tender	G. MacDonald	July 21 st , 2021	S. O'Brien
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DWG. No. **TITLE**

Skinners Pond Structure #401 Rehabilitation

Structural

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Part 1 General

1.1 PROJECT LOCATION

- .1 This project is located at the Skinners Pond Harbour in Prince County, Prince Edward Island.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Fisheries and Oceans, Small Craft Harbours Branch is preparing the rehabilitation of an existing steel sheet pile structure.
- .2 The work includes but is not limited to:
 - .1 Mobilization to site;
 - .2 Installation and maintenance of environmental controls required to complete the work;
 - .3 Complete dredging and excavation work;
 - .4 Complete repairs to steel sheet piling;
 - .5 Install new tie rods and waler bolts;
 - .6 Backfill inside existing structure;
 - .7 Construct new concrete copewall;
 - .8 Construct new concrete deck;
 - .9 Install new curb and ladder assemblies;
 - .10 Complete site grading and site cleanup;
 - .11 Removal of all environmental controls;
 - .12 Demobilization from the site.
- .3 The above listed work is subject to the following constraints during construction:
 - .1 In-water work shall be in accordance with all Provincial and Federal environmental regulations and any accompanying documents completed for this project.
 - .2 In-water work is limited to excavation below Low Normal Tide (LNT) and placement of geotextile and rock materials as discussed previously.
 - .3 Construction activities shall not detrimentally impact the surrounding environment or waterway, shall respect allowable windows for in-water work, and shall respect the requirements of cultural resources.
- .4 The Contractor is responsible for the delineation of the construction zones.
- .5 All work to be carried out in accordance with applicable federal, provincial regulations for those agencies having jurisdiction for the work.
- .6 The Contractor must be aware that other construction work or on-going fishery activity may potentially be underway at other locations near the project site during the time frame of this contract. No claims shall be accepted due to failure to co-ordinate this work with other construction or fishery efforts in the area.

1.3 CONTRACT METHOD

- .1 Construct Work under Unit Price and Lump Sum items contract.

1.4 CODES AND STANDARDS

- .1 Perform work in accordance with any code of federal, provincial or local application provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.
- .2 Materials and workmanship must conform to or exceed applicable standards of Canadian General Standards Board (CGSB), Canadian Standards Association (CSA), American Society for Testing and Materials (ASTM), National Building Code - FCS Standard 373 (Piers and Wharves) and other standards organizations.
- .3 Conform to latest revision at the date of Tender of any referenced standard as re-affirmed or revised to date of specification. Standards or codes not dated shall be deemed editions in force on date of tender advertisement.

1.5 SITE CONDITIONS

- .1 The Contractor will be responsible to visit the site and review existing site conditions.
- .2 Before submitting a bid, it is recommended that bidders visit the site to review and verify the form, nature and extent of the work, materials needed, the means of access and the temporary facilities required to perform the Work.
- .3 Obtain prior permission from the Departmental Representative before carrying out such site inspection.
- .4 Contractors, bidders or those they invite to site are to review specification Section 01 35 29.06 – Health and Safety Requirements before visiting site. Take all appropriate safety measures for any visit to site, either before or after acceptance of bid.
- .5 Details of the existing structure are for the Contractor to determine in considering use with over-weight and non-conforming vehicles in carrying out work on this project.
- .6 For geotechnical and borehole information, refer to Drawings.

1.6 INTERPRETATION OF DOCUMENTS

- .1 Supplementary to the Order of Precedence article of the General Conditions of the Contract, the Division 01 Sections take precedence over the technical specification sections in other Divisions of the Specifications Manual.
- .2 Due to the existing condition of the wharf, the existing capacity of the existing structure has been reduced. The use of mobile equipment (cranes, excavators, trucks, etc.) has not been reviewed and therefore is not permitted without further review.
- .3 Prior to the contractor using mobile equipment on the existing wharf, a stamped letter is required from a Professional Engineer engaged by the contractor stating that the loads from the proposed equipment have been analyzed and found acceptable to be operated with conditions and restrictions of the wharf. This submittal is required to be Submitted to the Department Representative in accordance with Section 01 33 00 - Submittal Procedures.

1.7 TERM ENGINEER

- .1 Unless specifically stated otherwise, the term Engineer where used in the Specifications and on the Drawings shall mean the Departmental Representative as defined in the General Conditions of the Contract.

1.8 SITE SURVEY AND SETTING OUT WORK

- .1 Contractor to carry out all layout. The Contractor is responsible for the layout of the new work as per the contract drawings. For vertical geometry, a project specific datum is available and is defined on the contract drawings. Refer to the contract drawings for more details.
- .2 The Contractor shall assume full responsibility for and execute complete layout of work locations, lines and elevations indicated.
- .3 The Contractor shall supply such devices as straight edges and templates required to facilitate Departmental Representative's inspection of work.
- .4 The Contractor shall provide coordinates, elevations, and dimensions in the field, as required by the Departmental Representative.

1.9 WORK WITHIN SITE BOUNDARIES

- .1 The project is within a working fishing harbour. It is essential that DFO lands and adjacent properties remain as undisturbed as possible. The Contractor will be expected to use standards and methods beyond those for normal construction in order to protect the environment and ensure minimal impact from the work. Contract limits shall be strictly adhered to and every precaution shall be taken to minimize environmental damage and disruption to vegetation, wildlife habitat, adjacent areas and properties, structures or existing services, on construction and storage sites and on access routes/roads to the worksite.
 - .1 If any damage occurs during construction, the Contractor is responsible to bear the expense to immediately restore such damaged areas to the satisfaction of Departmental Representative.
 - .2 If Contractor fails to repair damage to the satisfaction of the Departmental Representative, the Departmental Representative may have repairs completed by others at the Contractor's expense.
 - .3 The Contractor shall ensure that contracted work meets the standards outlined in the contract specification and drawings.
 - .4 The Contractor shall ensure that no damage will be done to any existing utilities.
 - .5 All sources of aggregate must be submitted to the Departmental Representative for approval at least two weeks prior to the start of any work.
 - .6 The Contractor will make arrangements with authorities or owners of private properties for quarrying and transporting materials and machinery over their properties and be responsible for obtaining and paying of fees as required.
 - .7 Special move permits for any over-weight and over-dimensional vehicles required to travel provincial highways must be secured by the Contractor and submitted to the Departmental Representative for review and approval prior to movement within Site boundaries.

1.10 MEASUREMENT FOR PAYMENT

- .1 Notify Departmental Representative sufficiently in advance of operations to permit required measurements for payment.
- .2 Items included under “Measurement for payment”. All lump sum and all unit price items shall include all materials, labour, equipment, and all other items necessary to complete the work. See also Section 01 29 10.

Item 1: Mobilization and Demobilization:

- .1 Mobilization and demobilization shall constitute a lump sum for measurement purposes. Final payment for this item will only be made when all work is complete and all materials, equipment and other facilities are removed, the site cleaned and left in a condition satisfactory to the Departmental Representative.

Item 2: Siteworks, Demolition and Removals:

- .1 Siteworks, demolition and removals shall constitute a lump sum for measurement purposes. All site work, demolition, removals, disposals, and local excavation and re-instatement of material on North/East faces to facilitate the copewall construction shall be included in this item. All underwater excavation along the West Face shall be excluded from this item.

Item 3: Underwater Excavation:

- .1 Underwater excavation shall constitute a unit price per cubic meter for measurement purposes. This item shall include excavation and placement of materials into the containment cell from along the West face only.

Item 4: Structural Steel Repairs:

- .1 Structural Steel Repairs shall constitute a unit price per square meter for measurement purposes. This item shall include the supply and installation of all structural steel required to complete the repairs to the existing steel sheet pile wall.

Item 5: Tie-Rods:

- .1 Tie-Rods shall constitute a unit price per each assembly for measurement purposes. This item shall include the supply and installation of all tie rods and hardware required to complete the installation of the tie rods as per the plans and specifications.

Item 6: Waler Bolts:

- .1 Waler Bolts shall constitute a unit price per each assembly for measurement purposes. This item shall include the supply and installation of waler bolts and hardware required to complete the installation of the these bolts as per the plans and specifications.

Item 7: Cast-in-Place Concrete Deck:

- .1 Cast-in-Place (CIP) Concrete Deck shall constitute a unit price per cubic meter for measurement purposes based on neat dimensions outlined on the design drawings. This item shall include the supply and installation of all CIP concrete, formwork, anchors, and steel reinforcing as required to complete the work.

Item 8: Cast-in-Place Concrete Copewall:

- .1 Cast-in-Place (CIP) Concrete Copewall shall constitute a unit price per cubic meter for measurement purposes based on neat dimensions outlined on the design drawings. This item shall include the supply and installation of all CIP concrete, formwork, steel stud strips and steel reinforcing as required to complete the work.

Item 9: Type 1 Gravel:

- .1 Type 1 Gravel shall constitute a price per metric tonne for measurement purposes. This item shall include the supply and installation of all Type 1 Gravel required to complete the work.

Item 10: Premium Borrow:

- .1 Premium Borrow shall constitute a price per metric tonne for measurement purposes. This item shall include the supply and installation of all Premium Borrow as required to complete the work.

Item 11: Geotextile:

- .1 Geotextiles shall constitute a lump sum price for measurement purposes. This item shall include the supply and installation of all geotextiles required to complete the work.

Item 12: Timber Fenders:

- .1 Timber Fenders shall constitute a lump sum price for measurement purposes. This item shall include the supply and installation of all Timber Fenders and hardware required to complete the work.

Item 13: Ladders:

Ladders shall constitute a unit price per each assembly for measurement purposes. This item shall include the supply and installation of the ladder and all hardware required to complete the work.

Item 14: Vertical Holdfasts:

Vertical Holdfasts shall constitute a unit price per each assembly for measurement purposes. This item shall include the supply and installation of each vertical holdfast and all hardware required to complete the work.

Item 15: Wheel Guard:

- .1 Wheel Guard shall constitute a unit price per linear meter for measurement purposes. This item shall include the supply and installation of all Wheel Guard including the Mooring Holdfasts, the holdfasts at each ladder, and all hardware required to complete the work.

1.11 MAINTENANCE OF WORK DURING CONSTRUCTION

- .1 Maintain work during construction. Undertake continuous and effective maintenance daily, with adequate equipment and forces so that the roadway or structures are continuously kept in a condition satisfactory to Departmental Representative.

1.12 WORK SCHEDULE

- .1 Provide to the Departmental Representative in writing and within 7 working days after Contract award, a detailed construction schedule. The schedule as a minimum shall show the anticipated start and completion dates for all key work required to complete the project.
- .2 “Completely Accessible” as noted below shall be defined as providing berthage space for vessels, access to and from the structures (including granular surface behind the structure as a minimum) and also complete decks that are free and clear to use for trap storage.
- .3 Work shall be in accordance with the following work restrictions:
 - .1 Construction must be completed within the property boundaries of the facility unless otherwise approved by the Departmental Representative.
 - .2 The Contractor must setup their onsite office and laydown all materials within the laydown area approved by a Departmental Representative.
 - .3 **Work on site will not be permitted prior to October 18th, 2021, in order to not disrupt the fishing activities. Project submittals can commence immediately after acceptance of bid and order of materials can commence following shop drawing approvals as per section 01 33 00.**
- .4 All work shall be completed as per the terms and conditions of the environmental permits for the project.
- .5 Interim reviews of work progress based on work schedule will be conducted as decided by Departmental Representative and schedule updated by Contractor in conjunction with and to approval of Departmental Representative.
- .6 No work will begin until the pre-construction and site safety meeting is held.
- .7 Following the pre-construction meeting and approval of the schedule, traffic control plan, environmental protection plan and site specific health and safety plan, the work will be so scheduled to meet the time restraints and have the project completed on time.

1.13 CONTRACTOR’S USE OF SITE

- .1 Use of site: for execution of work within close proximity of the wharf and those areas specified by the Departmental Representative.
- .2 Contractor’s use of site is to be coordinated with the Harbour Authority of Skinners Pond.

1.14 SANITARY SERVICES

- .1 The Contractor shall provide and maintain sanitary facilities for the use of workers at locations specified by the Departmental Representative. Provision of sanitary facilities shall meet requirements of provincial government and municipal statutes and authorities.

1.15 PROJECT MEETINGS

- .1 A pre-construction meeting and regular progress meetings shall be held by the contractor throughout the project. Refer to Section 01 31 19 Project Meetings for details.

1.16 DEPARTMENTAL REPRESENTATIVE

- .1 Departmental Representative will be assigned after contract award.

1.17 DOCUMENTS REQUIRED

- .1 Maintain at job site, one copy each of following:
 - .1 Contract drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Reviewed drawings.
 - .5 Change orders.
 - .6 Other modifications to Contract.
 - .7 Copy of approved work schedule.
 - .8 Field test reports
 - .9 Manufacturer's installation and application instructions.
 - .10 Site specific Hazard Assessment, Health and Safety Plan and other safety related documents.
 - .11 Other documents as stipulated elsewhere in the Contract Documents.

1.18 ADDITIONAL DRAWINGS

- .1 Departmental Representative may furnish additional drawings for clarification. These additional drawings have same meaning and intent as if they were included with plans referred to in Contract documents.

1.19 MEASUREMENT FOR PAYMENT

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

1.20 CUTTING AND PATCHING

- .1 Cut and patch as required to make work fit.
- .2 Where new work connects with existing and where existing work is altered, cut, patch and make good to match existing work.

1.21 RELICS, ANTIQUITIES AND WILDLIFE HABITAT

- .1 Protect relics, antiquities, wildlife habitat, items of historical or scientific interest such as animal nesting site or similar objects found during course of work.
- .2 Give immediate notice to Departmental Representative and await Departmental Representative's written instructions before proceeding with work in this area.
- .3 Relics, antiquities and items of historical or scientific interest remain her Majesty's property.

1.22 PERMITS/AUTHORITIES

- .1 The Contractor shall obtain, and pay for, permits from authorities as required for all operations and construction. They shall also comply with all pertinent regulations of all authorities having jurisdiction over the work. The Contractor shall provide copies of all permits to the Departmental Representative prior to starting the work. The Contractor shall be responsible for obtaining all applicable permits, inspections and approvals required and shall pay all changes in connection therewith (including all permitting required to upgrade existing electrical services).
- .2 Advise the Canadian Coast Guard, Marine Communication and traffic Services (MCTS) toll free at 1-800-686-8676 sufficiently in advance of commencement of work or when deploying or removing site markings in order to allow for appropriate Notices to Shipping/Mariners action.

1.23 PROTECTION

- .1 Store all materials and equipment to be incorporated into work to prevent damage by any means.
- .2 Repair and replace all materials or equipment damaged in transit or storage to the satisfaction of the Departmental Representative and at no cost to Crown.
- .3 Contractor will take adequate precautions to protect existing structures when operating tracked equipment. Contractor shall also take care as to not detrimentally surcharge new and/or existing wharf structures during construction activities.
- .4 Exercise care so as not to obstruct or damage public or private property in the area.
- .5 At completion of work, restore area to its original condition. Damage to ground and property will be repaired by Contractor (this shall include any asphalt damaged as a result of construction activities or storing materials). Remove all construction materials, residue, excess, etc., and leave site in a condition acceptable to Departmental Representative.

1.24 EXISTING SERVICES

- .1 Carry out work at times directed by authorities having jurisdiction, 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 approval from Departmental Representative for any shut down or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.
- .4 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.
- .5 Record locations of maintained, re-routed and abandoned service lines.
- .6 Verify locations of any underground utilities.
- .7 Where work involves breaking into or connecting to existing services, carry out work at times directed by governing authorities, with minimum of disturbance to pedestrians, vehicular traffic and user operations.

END OF SECTION

Part 1 General

1.1 ACCESS AND EGRESS

- .1 Design, construct and maintain temporary "access to" and "egress from" work areas, in accordance with relevant municipal, provincial and other regulations.

1.2 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated.
- .2 Provide for personnel and vehicle access.
- .3 Where safety and/or security is reduced by the work, provide temporary means to maintain safety and/or security.
- .4 See Section 01 10 10 for schedule restrictions.

1.3 ALTERATIONS, ADDITIONS OR REPAIRS

- .1 Execute work with least possible interference or disturbance to public and normal use of premises. Arrange with Departmental Representative to facilitate execution of work.

1.4 EXISTING SERVICES

- .1 Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission.
- .2 Provide services for personnel, pedestrian, and vehicular traffic where such services have been interrupted due to construction.

1.5 SPECIAL REQUIREMENTS

- .1 Maintenance to vehicles and equipment is prohibited on Harbour Authority property.
- .2 Blasting is not permitted.
- .3 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .4 Keep within limits of work and avenues of ingress and egress.

END OF SECTION

Part 1 General

1.1 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.
- .4 Work schedule content to include as a minimum the following:
 - .1 Bar (GANTT) Charts, indicating all work activities, tasks and other project elements, their anticipated durations, planned dates for achieving key activities and major project milestones supported with;
 - .2 Written narrative on key elements of work illustrated in bar chart, providing sufficient details to demonstrate a reasonable implementation plan for completion of project within designated time.
- .5 Work schedule must take into consideration and reflect the work phasing, required sequence of work, special conditions and operational restrictions as specified elsewhere and below and indicated on drawings.
- .6 Schedule work in cooperation with the Departmental Representative. Incorporate within Work Schedule, items identified by Departmental Representative during review of schedule.
- .7 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.
- .8 Ensure that all subtrades and subcontractors are made aware of the work restraints and operational restrictions specified.
- .9 Schedule Updates:
 - .1 Submit when requested by Departmental Representative.
 - .2 Provide information and pertinent details explaining reasons for necessary changes to implementation plan.
 - .3 Identify problem areas, anticipated delays, impact on schedule and proposed corrective measures to be taken.
- .10 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.

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

1.2 PROJECT PHASING

- .1 Refer to contract documents for the construction completion date.

1.3 OPERATIONAL RESTRICTIONS

- .1 The Contractor must recognize that harbour users will be affected by implementation of this Contract. The Contractor must perform the Work with utmost regard to the safety and convenience of Harbour users. All work activities must be planned and scheduled with this in mind.
- .2 Site access must be restricted to only those approved by Contractor and knowledgeable of the Contractor's Site Specific Safety Plan (SSSP).
- .3 Safety Signage:
 - .1 Provide on-site, and erect as required during progress of work, proper signage, mounted on self-supporting stands and/or fencing, warning the public of construction activities progress and alerting need to exercise caution in the area. This shall include signage to notify approaching vessels of construction activities in the harbour.
 - .2 Signage to be professionally printed and mounted on wooden backing, coloured and to express messages as directed by the Departmental Representative.
 - .3 Include costs for the supply and installation of these signs in the bid price.
- .4 Stock pile materials on site in laydown area identified as agreed upon by the Departmental Representative and the local Harbour Authority.
- .5 Dust and Dirt Control:
 - .1 See section 01 50 00 and 01 74 11 for dust control and cleaning requirements.
 - .2 Effectively plan and implement dust control measures and cleaning activities as an integral part of all construction activities. Review all measures with the Departmental Representative before undertaking work, especially for major dust generating activities.
 - .3 Do not allow demolition debris and construction waste to accumulate on site and contribute to the propagation of dust.
 - .4 As work progresses, maintain construction areas in a tidy condition at all times.
 - .5 Do not stockpile removed fill material any higher than 3m.

1.4 PROJECT MEETINGS

- .1 Schedule and administer project meetings for entire duration of work and more often when directed by Project Manager. Refer to Section 01 31 19 for required project meeting frequency.
- .2 Hold meetings at project site or where approved by Project Manager.

1.5 WORK COORDINATION

- .1 The Contractor is responsible for coordinating the work of the various trades and predetermining where the work of such trades interfaces with each other.
 - .1 Designate one person from own employees having overall responsibility to review contract documents and shop drawings, plan and manage such coordination.
- .2 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 Contractor to be resolved at own cost.

END OF SECTION

Part 1 General

1.1 GENERAL

- .1 This section covers the measurement of Work done for payment purposes.
- .2 There shall be no measurement or payment for Work carried out beyond the limits defined on the Drawings.
- .3 The Contractor will only be entitled to payment when prior written authorization has been received from the Departmental Representative for utilization and then only to the extent of the work authorized by the Departmental Representative.
- .4 The lump sum prices for all items in the Unit Price and Lump Sum Table shall represent the full compensation for the work of the item and shall include the cost of furnishing all materials, labour, tools, and equipment necessary to complete the work in accordance with the Contract, the Drawings and Specifications, and shall cover all costs of surety. Each item shall include all necessary supervision, plant and services, and all operations and allowances customary and necessary to complete each item and the Contract as a whole, notwithstanding the fact that not every such necessary operation is mentioned or included specifically for measurement.
- .5 Unless specified otherwise, all materials necessary to complete the items listed in the Unit Price and Lump Sum Table and the finished Work, shall be new materials supplied by the Contractor and the cost of such material is to be included in the Contractor's prices.
- .6 All measurements for progress payment purposes shall be taken jointly by the Contractor and the Departmental Representative.
- .7 The following measurement procedures are for the purpose of measuring progress on the lump sum contract:
 - .1 Linear:
 - .1 Items which are measured by the linear meter shall be based on the final installed lengths and measure along the centreline of installation unless otherwise indicated on the plans.
 - .2 Area:
 - .1 Longitudinal and transverse measurements shall be made on the actual flat or sloped surface.
 - .3 Volume:
 - .1 In computing volumes of excavation or for infill quantities, average end area method will be used unless otherwise directed by Departmental Representative.
 - .2 All volume measurements refer to in-place measures unless specified otherwise.
 - .4 Mass:
 - .1 The terms "tonne" or "metric tonne" shall mean 1000 kilograms (kg).
 - .2 Materials which are specified for measurement by mass shall be weighed on scales approved by Departmental Representative. Units used to haul

material being paid for by mass shall bear legible identification numbers plainly visible to scale person as it approaches and leaves scale-house.

- .8 Refer to Section 01 10 10 – General Instructions, “Measurement for Payment” for measurement procedures for all payment items.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

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

1.2 APPOINTMENT AND PAYMENT

- .1 Departmental Representative will appoint and pay for services of testing laboratory except as follows:
 - .1 Inspection and testing required by laws, ordinances, rules, regulations, or orders of public authorities.
 - .2 Inspection and testing performed exclusively for Contractor's convenience.
 - .3 Testing, adjustment and balancing of equipment and systems.
 - .4 Mill tests and certificates of compliance.
 - .5 Tests specified to be carried out by Contractor under supervision of Departmental Representative.
 - .6 Additional tests specified as follows in the following paragraph.
- .2 Where tests or inspections by designated testing laboratory reveal that the Work is not completed in accordance with the contract requirements; the Contractor shall pay the costs for additional tests or inspections as required by Departmental Representative to verify acceptability of corrected work.

1.3 CONTRACTOR'S RESPONSIBILITIES

- .1 Provide labour, equipment, and facilities to:
 - .1 Provide access to Work for inspection and testing.
 - .2 Facilitate inspections and tests.
 - .3 Make good Work disturbed by inspection and test.
 - .4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.
- .2 Notify Departmental Representative a minimum of 48 hours in advance of operations to allow for assignment of laboratory personnel and scheduling of test.
- .3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.
- .4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Departmental Representative.

END OF SECTION

Part 1 General

1.1 PRECONSTRUCTION MEETING

- .1 After receiving the Contractor's schedule, traffic control plan, health and safety hazard assessment, and environmental protection plan, and prior to start of construction, a meeting involving Contractor, Project Manager, Engineer, field inspectors and DFO-SCH and end users will be held at a place and time to be determined by the Contractor.
- .2 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
- .3 Agenda to include:
 - .1 Review of the design and the intentions of the project.
 - .2 Implications of the contract.
 - .3 Health and safety.
 - .4 Methods of construction.
 - .5 Environment protection methods.
 - .6 Traffic control.
 - .7 Appointment of official representative of participants in the Work.
 - .8 Schedule of Work: to be in GANTT Chart format.
 - .9 Schedule of submission of shop drawings, samples, etc. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .10 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
 - .11 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
 - .12 Proposed changes, change orders, procedures, approvals required, and administrative requirements.
 - .13 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
 - .14 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
 - .15 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.
 - .16 Monthly progress claims, administrative procedures, photographs, hold backs.
 - .17 Appointment of inspection and testing agencies or firms.
 - .18 Insurances, transcript of policies.

1.2 PROGRESS MEETINGS

- .1 Project Manager will arrange bi-weekly progress meetings and assume responsibility for setting times and recording and distributing minutes. Minutes shall be distributed within 3 business days of the meeting. Contractor shall notify all attending parties a minimum of 5 days in advance of the meeting.
- .2 Contractor, major Subcontractors involved in Work, field inspector and Project Manager are to be in attendance.

- .3 Progress meeting agenda to include the following:
 - .1 Review, approval of minutes of previous meeting.
 - .2 Review of Work progress since previous meeting.
 - .3 Field observations, problems, conflicts.
 - .4 Problems which impede construction schedule.
 - .5 Review of off-site fabrication delivery schedules.
 - .6 Corrective measures and procedures to regain projected schedule.
 - .7 Revision to construction schedule.
 - .8 Progress schedule, during succeeding work period.
 - .9 Review submittal schedules: expedite as required.
 - .10 Maintenance of quality standards.
 - .11 Review proposed changes for effect on construction schedule and on completion date.
 - .12 Other business.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Refer to Technical Specifications which reference "SUBMITTALS" under PART 1 – GENERAL of each section.

1.2 ADMINISTRATIVE

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

1.3 SHOP DRAWINGS AND PRODUCT DATA

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Submit drawings bearing stamp and signature of qualified Professional Engineer registered or licensed in Province where the work is being completed.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

- .4 Allow ten (10) business days, unless otherwise noted, for Departmental Representative's review of each submission
- .5 Adjustments made on shop drawings by the Departmental Representative are not intended to change Contract Price. If adjustments change the original scope of work and therefore the contract value, state such in writing to the Departmental Representative for review prior to proceeding with Work.
- .6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.
- .7 Accompany submissions with transmittal letter, in duplicate, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
- .8 Submissions include:
 - .1 Date and revision dates.
 - .2 Project title and 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 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.
- .9 After Departmental Representative's review, distribute copies.
- .10 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.

- .11 Submit electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by the Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.
- .12 Submit electronic copy of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accordance with specified requirements.
 - .2 Testing must have been within 2 years of date of contract award for project.
- .13 Submit electronic copy of certificates for requirements requested in specification Sections and as directed by Departmental Representative.
 - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
 - .2 Certificates must be dated after award of project contract complete with project name.
- .14 Submit electronic copy of manufacturer's instructions for requirements requested in specification Sections unless otherwise directed by Departmental Representative.
 - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .15 Submit electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Documentation of the testing and verification actions by manufacturer's representative to confirm compliance with manufacturer's standards and instructions.
- .16 Delete information not applicable to project.
- .17 Supplement standard information to provide details applicable to project.
- .18 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, electronic copy will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .19 The review of shop drawings by Departmental Representative is for sole purpose of ascertaining conformance with general concept.
 - .1 This review shall not mean that Departmental Representative approves detail design inherent in 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 requirements of construction and Contract Documents.
 - .2 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 sub-trades.

1.4 SAMPLES

- .1 Submit for review samples as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to Departmental Representative's site office.
- .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 affect value of Work, state such in writing to Departmental Representative 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.

1.5 CERTIFICATES AND TRANSCRIPTS

- .1 Immediately after award of Contract, submit Workers' Compensation Board status.
- .2 Submit transcription of insurance immediately after award of Contract. No site work to occur until insurance transcript has been received.
- .3 Submit Certificates of Conformance to the Departmental Representative, stating that the component(s) has been installed in conformance with the approved shop drawings. Certificate of Conformance to bear the seal and signature of a Professional Engineer licensed in the Province where the work is being completed.
- .4 Certificates of Conformance required for, but not limited to, the following:
 - .1 All components where shop drawings are required (unless otherwise directed by the Departmental Representative).
 - .2 As specified elsewhere in the Contract Documents.
- .5 Due to the existing condition of the wharf, the existing capacity of the existing structure has been reduced. The use of mobile equipment (cranes, excavators, trucks, etc.) has not been reviewed and therefore is not permitted without further review. See specification 01 10 10 – 1.6.3 for further information.

1.6 PROCEDURES

- .1 Provide procedures required as specified in the Contract documents or as directed by the Departmental Representative.

1.7 AS-BUILT DOCUMENTS

- .1 Provide As-Built documents in accordance with Sections 01 77 00 Closeout Procedures and Section 01 78 00 Closeout Submittals and as directed by the Departmental Representative.

1.8 OTHER SUBMISSIONS

- .1 Provide a construction schedule and cash flow forecasts updated every month as well as any additional interim updates requested by the departmental representative.
- .2 Provide all other submissions as required by law and the Contract documents.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Fire Safety Requirements
- .2 Hot Work Permit
- .3 Existing Fire Protection and Alarm Systems

1.2 RELATED SECTIONS

- .1 Section 01 35 29.06 Health and Safety Requirements.

1.3 REFERENCES

- .1 National Fire Code 2015
- .2 National Building Code 2015

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.
 - .5 Use of cellphone or mobile device in area of equipment refueling.

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 2015.
 - .2 National Building Code 2015.
 - .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.

1.7 HOT WORK AUTHORIZATION

- .1 Obtain Departmental Representative's written "Authorization to Proceed" before conducting any form of Hot Work on site.

- .2 To obtain authorization submit to Departmental Representative:
 - .1 Contractor's typewritten Hot Work Procedures to be followed on site as specified below.
 - .2 Description of the type and frequency of Hot Work required.
 - .3 Sample Hot Work Permit to be used.
- .3 Upon review and confirmation that effective fire safety measures will be implemented and followed during performance of hot work, Departmental Representative will give authorization to proceed as follows:
 - .1 Issue one written "Authorization to Proceed" covering the entire project for duration of work or;
 - .2 Subdivide the work into pre-determined, individual activities, each activity requiring a separately written authorization to proceed.
- .4 Requirement for individual authorization will be based on:
 - .1 Nature or phasing of work;
 - .2 Risk to Facility operations;
 - .3 Quantity of various trades needing to perform hot work on project or;
 - .4 Other situation deemed necessary by Departmental Representative to ensure fire safety on premises.
- .5 Do not perform any Hot Work until receipt of Departmental Representative's written "Authorization to Proceed" for that portion of work.

1.8 HOT WORK PROCEDURES

- .1 Develop and implement safety procedures and work practices 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 29.06.
 - .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 30 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 Harbour Authority.
- .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 29.06.

1.9 HOT WORK PERMIT

- .1 Hot Work Permit to include the following:
 - .1 Project name and project number;
 - .2 Structure name and specific 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 FIRE PROTECTION AND ALARM SYSTEMS

- .1 Fire protection and alarm systems shall not be:
 - .1 Obstructed.
 - .2 Shut-off, unless approved by Departmental Representative.
 - .3 Left inactive at the end of a working day or shift.
- .2 Do not use fire hydrants, standpipes and hose systems for purposes other than firefighting.
- .3 Costs incurred, from the fire department, Harbour Authority and tenants, resulting from negligently setting off false alarms will be charged to the Contractor in the form of financial progress payment reductions and holdback assessments against the Contract.

1.11 DOCUMENTS ONSITE

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

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

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

1.2 RELATED SECTIONS

- .1 Section 01 35 29.06: Health and Safety

1.3 REFERENCES

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

1.4 DEFINITIONS

- .1 Electrical Facility: means any system, equipment, device, apparatus, wiring, conductor, assembly or part thereof that is used for the generation, transformation, transmission, distribution, storage, control, measurement or utilization of electrical energy, and that has an amperage and voltage that is dangerous to persons.
- .2 Guarantee of Isolation: means a guarantee by a competent person in control or in charge that a particular facility or equipment has been isolated.
- .3 De-energize: in the electrical sense, that a piece of equipment is isolated and grounded, e.g. if the equipment is not grounded, it cannot be considered de-energized (DEAD).
- .4 Guarded: means that 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 Comply with the following in regards to isolation and lockout of electrical facilities and equipment:

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

1.6 SUBMITTALS

- .1 Submit copy of proposed lockout procedures and sample of lockout permit or lockout tags to Departmental Representative for review, within 14 calendar days of acceptance of bid.
- .2 Submit in accordance with section 01 33 00.

1.7 ISOLATION OF EXISTING SERVICES

- .1 Obtain Departmental Representative's written authorization prior to working on existing live or active electrical facilities and equipment and before proceeding with isolation of such item.
- .2 To obtain authorization, submit to Departmental Representative the following documentation:
 - .1 Written request to isolate the particular service or facility and;
 - .2 Copy of Contractor's Lockout Procedures.
- .3 Make a Request for Isolation for each event, unless directed otherwise by Departmental Representative, as follows:
 - .1 Fill-out standard form in current use at the Facility as provided by Departmental Representative or;
 - .2 Where no form exist, make written request indicating:
 - .1 The equipment, system or service to be isolated and its location;
 - .2 Duration of isolation period (ie: start time & date and completion time & date).
 - .3 Voltage of service feed to system or equipment being isolated.
 - .4 Name of person making the request.
- .4 Do not proceed with isolation until receipt of written notification from Departmental Representative granting the Isolation Request and authorization to proceed with the work.
 - .1 Note that Departmental Representative may designate another person at the Facility being authorized to grant the Isolation Request.
- .5 Conduct safe, orderly shutdown of equipment or facility. De-energize, isolate and lockout power and other sources of energy feeding the equipment or facility.

- .6 Determine in advance, as much as possible, in cooperation with the Departmental Representative, the type and frequency of situations which will require isolation of existing services.
- .7 Plan and schedule shut down of existing services in consultation with the Departmental Representative and the Harbour Authority. Minimize impact and downtime of Facility operations. Follow Departmental Representative's directives in this regard.
- .8 Conduct hazard assessment as part of the process in accordance with health and safety requirements specified Section 01 35 29.06.

1.8 LOCKOUTS

- .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 workforce 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 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 system.
 - .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 Incorporate site specific rules and procedures in force at site as provided by Harbour Authority through the Departmental Representative.
- .2 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 Brief all workers and subcontractors on requirements of this section. Stringently enforce use and compliance.
- .2 Failure to follow lockouts procedures specified herein may result in the issuance of a Non-Compliance notification as specified in section 01 35 29.06.

1.10 DOCUMENTS ONSITE

- .1 Post Lockout Procedures on site in common location for viewing by workers.
- .2 Keep copies of Request for Isolation forms and lockout permits and tags issued to workers on site for full duration of Work.
- .3 Upon request, make available to Departmental Representative or to authorized safety Representative for inspection.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS)
- .2 Government of Canada
 - .1 Canada Labour Code – Part II (entitled Occupational Health and Safety)
 - .2 Canada Occupational Health and Safety Regulations (COHS)
- .3 Province of Prince Edward Island
 - .1 Occupational Health and Safety Act
 - .2 Occupational Health and Safety Regulations made pursuant to the Act
- .4 Part 8 of the National Building Code
- .5 Municipal by-laws and ordinances.

1.2 DEFINITIONS

- .1 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;
 - .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 and safety associated with the Work.
- .2 Medical Aid Injury: any minor injury for which medical treatment was provided and the cost of which is covered by the Workers' Compensation Board of the province in which the injury incurred.
- .3 Work site: where used in this section shall mean areas, located at the premises where Work is undertaken, used by Contractor to perform all of the activities associated with the performance of the Work.

1.3 SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit site specific Health and Safety Plan (including site specific hazard assessment): within 10 days of notification of Bid Acceptance and prior to commencement of work.
- .3 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments. Revise plan as appropriate and resubmit within ten (10) working days after receipt of comments.
- .4 Submit revisions and updates made to the Contractor's Health and Safety plan during the course of the Work.

- .5 Submit records of Contractor's Health and Safety meetings when requested.
- .6 Submit Construction Safety Checklists after completion.
- .7 Submit copies of reports of directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .8 Submit copies of incident and accident reports.
- .9 Submit WHMIS MSDS – Material Safety Data Sheets.
- .10 Submit proof of Workers' Compensation Coverage through submission of Letter of Good Standing. Contractor must maintain good standing throughout the duration of the contract.
- .11 Submit Certificate of Recognition or Letter of Good Standing issued jointly by the Workers' Compensation Board of Prince Edward Island and an occupational health and safety organization approved by the Workers' Compensation Board of Prince Edward Island.
- .12 Contractor's responsibility for Health and Safety is not relieved in any way by the Department Representative's review or lack of review of these submittals.
- .13 Building Permit(s), Compliance Certificates and other permits obtained.
- .14 Name of Contractor's representative designated to perform Health and Safety supervision on site.

1.4 COMPLIANCE REQUIREMENTS

- .1 Comply with the Occupational Health and Safety Act for the Province of Prince Edward Island and the Regulations made pursuant to the Act.
- .2 Comply with Canada Labour Code Part II, and the Canada Occupational Safety and Health Regulations made under Part II of the Canada Labour Code.
- .3 Observe and enforce construction safety measures required by:
 - .1 2015 National Building Code of Canada, Part 8;
 - .2 Provincial Worker's Compensation Board;
 - .3 Municipal by-laws and ordinances.
- .4 In event of conflict between any provisions of above authorities the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, Departmental Representative will advise on the course of action to be followed.
- .5 Maintain Workers Compensation Coverage for duration of Contract. Submit Letter of Good Standing to Departmental Representative upon request.
- .6 Medical Surveillance: Where prescribed by legislation or regulations, obtain and maintain worker medical surveillance documentation.

1.5 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons and environment adjacent to the site to the extent that they may be affected by the 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 statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.6 SITE CONTROL AND ACCESS

- .1 Control work site and entry points. Grant and allow entry to only workers and other persons so authorized. Immediately stop non-authorized persons from circulating within construction areas and remove from site.
- .2 Implement procedures for granting permission to enter onto work site to all persons who require access. Procedures to include the provision of a site safety orientation session.
- .3 Delineate and isolate construction areas from other areas of site by use of appropriate means. Erect barricades, fences, boarding and temporary lighting as required. See Section 01 56 00 – Temporary Barriers and Enclosures for minimum type of barriers acceptable.
- .4 Erect signage at entry points and at other strategic locations indicating restricted access and conditions of access. Signage must be professionally made in both official languages or by use of well understood graphic symbols.
- .5 Secure work site against entry when inactive or unoccupied and to protect persons against harm. Provide security guard as deemed necessary to protect site against entry.
- .6 Ensure persons granted access is fitted and wear appropriate personnel protective equipment (PPE). Be responsible for the provision of such PPE to persons who require access to conduct work or perform inspections.

1.7 PROTECTION

- .1 Provide temporary facilities for protection and safe passage of vehicular traffic around and adjacent to work site.
- .2 Provide safety barricades, lights and signage on work site as required to provide a safe working environment for workers.
- .3 Carry out work placing emphasis on health and safety of public, site personnel and protection of the environment over cost and schedule consideration for work.
- .4 Should unforeseen or peculiar safety related hazard or condition become evident during performance of work, immediately take measures to rectify the situation and prevent damage or harm. Advise Departmental Representative verbally and in writing.

1.8 FILING OF NOTICE

- .1 File Notice of Project and other Notices with Provincial authorities prior to commencement of work.

1.9 PERMITS

- .1 Obtain permits, licenses and compliance certificates, at appropriate times and frequency as stipulated by authorities having jurisdiction.
- .2 Where particular permit or compliance certificate cannot be obtained at the required stage of work, notify Departmental Representative in writing and obtain Departmental Representative's approval to proceed prior to carrying out that portion of work.

- .3 Post all permits on site. Submit copies to Departmental Representative.

1.10 HAZARD ASSESSMENTS

- .1 Implement and carry out a health and safety hazard assessment program as part of the work. Program to include:
 - .1 Initial hazard assessment carried out immediately upon notification of contract award and prior to commencement of work.
 - .2 On-going hazard assessments performed during the progress of work identifying new or potential health risks and safety hazards not previously known. As a minimum hazard assessments shall be carried out when:
 - .1 New sub-trade work, new subcontractor(s) or new workers arrive at the site to commence another portion of the work.
 - .2 The scope of work has been changed by Change Order.
 - .3 Potential hazard or weakness in current health and safety practices are identified by Departmental Representative or by an authorized safety representative.
 - .3 Hazard assessments to be project and site-specific, based on review of contract documents, site and weather conditions.
 - .4 Each hazard assessment to be made in writing. Keep copies of all assessments on site for duration of work. Upon request, make available to Departmental Representative for inspection.

1.11 PROJECT/SITE CONDITIONS

- .1 The following are known or potential project related safety hazards at site:
 - .1 Tidal water.
 - .2 Working over water.
 - .3 Buried electrical lines.
 - .4 Overhead electrical lines.
 - .5 Harbour user vessel and vehicle and other commercial traffic.
 - .6 Heavy equipment.
 - .7 Stability of existing structures.
 - .8 Working at heights.
 - .9 Working overhead.
 - .10 Demolition.
 - .11 Exposure.
 - .12 Remote site.
 - .13 Possible night-time work under artificial lighting.
- .2 Above lists shall not be construed as being complete and inclusive of safety and health hazards encountered as a result of Contractor's operations during the course of work.
- .3 Include above items into the hazard assessment program specified herein.

1.12 SAFETY MEETINGS

- .1 Prior to commencement of work attend health and safety meeting conducted by Departmental Representative. Departmental Representative will advise of time and location. Ensure attendance of:
 - .1 Superintendent of Work.
 - .2 Designated Health and Safety Site Representative
 - .3 Subcontractors.
- .2 Conduct regularly scheduled tool box and safety meetings during the Work in conformance with Occupational Health and Safety regulations.
- .3 Keep documents on site.

1.13 HEALTH AND SAFETY PLAN

- .1 Develop written site-specific Project Health and Safety Plan, based on hazard assessments, prior to commencement of work. Submit plan to Departmental Representative within 10 calendar days of Contract Award date.
- .2 Health and Safety Plan shall contain the following components:
 - .1 List of health risks and safety hazards identified by hazard assessments.
 - .2 Control measures used to mitigate risks and hazards identified.
 - .3 On-site Contingency and Emergency Response Plan as specified below.
 - .4 On-site Communications Plan as specified below.
 - .5 Name of Contractor's designated Health and Safety Site Representative and information showing proof of their 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.
 - .7 On-site Contingency and Emergency Response Plan shall include:
 - .1 Operational procedures, evacuation measures and communication process to be implemented in the event of an emergency.
 - .2 Evacuation plan: site layouts showing escape routes, marshalling areas. Details of alarm notification methods, fire drills, location of firefighting equipment and other related data.
 - .3 Name, duties and responsibilities of persons designated as Emergency Warden(s) and deputies.
 - .4 Emergency Contacts: name and telephone number of officials from Contractor, Sub-Contractors, federal and provincial departments having jurisdiction, local emergency resource organization.
 - .5 Harmonize plan with harbour Authority's Emergency Response and Evacuation Plan. Departmental Representative will provide pertinent data including name of DFO and Harbour Authority contacts.
 - .8 On-site Communications Plan:
 - .1 Procedures for sharing of work related safety information to workers and Sub-Contractors, including emergency and evacuation measures.

- .2 List of critical work activities shall be communicated with the Harbour Authority which have a risk of endangering health and safety of end users.
- .9 Address all activities of the Work including those of Sub-Contractors.
- .10 Review and update Health and Safety Plan regularly during the Work. Update as conditions warrant addressing additional health risks and safety hazards, such as whenever new trade or Sub-Contractors arrive at Work site.
- .11 Departmental Representative will respond in writing, where deficiencies or concerns are noted and may request re-submission of the Health and Safety Plan with correction of deficiencies or concerns.
- .12 Post copy of the Health and Safety Plan, and updates, prominently at Work site.

1.14 SAFETY SUPERVISION AND INSPECTIONS

- .1 Designate Health and Safety Site Representative to be present on site at all times during work, responsible for supervising health and safety and conducting safety inspections of work site.
- .2 Health and Safety Representative shall be recently trained in First Aid.
- .3 Health and Safety Representative shall be assigned the responsibility and authority to:
 - .1 Implement, monitor and enforce daily compliance with health and safety requirements of the Work.
 - .2 Conduct site safety orientation session to persons granted access to the Work site.
 - .3 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.
 - .4 Authority to stop and start work as deemed necessary for reasons of health and safety.
- .4 Conduct regularly scheduled safety inspections of work site as follows:
 - .1 Informal Inspections: carry out a minimum bi-weekly basis. Note deficiencies and remedial action taken in a log book or diary.
 - .2 Formal Inspections: carry out on a minimum monthly basis. Use standardized safety checklist forms. Prepare written report for each formal inspection. Document deficiencies, remedial action needed and assign responsibility for rectification to appropriate subcontractor or worker.
- .5 Cooperate with harbour Authority's Health and Safety Site Coordinator responsible for the entire site or facility, should one be designated by Departmental Representative.
- .6 Maintain safety inspection documentation on site

1.15 TRAINING

- .1 Ensure that workers, subcontractors and other authorized persons granted access to site are effectively trained in occupational health and safety and practices pertinent to their assigned tasks.
- .2 Maintain employee records and evidence of training received.

- .3 Make training records readily available for review by Departmental Representative upon request.
- .4 Should any unforeseen or peculiar safety-related factor, hazard or condition become evident during performance of Work immediately stop work and advise Department Representative verbally and in writing.
- .5 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.

1.16 MINIMUM SITE SAFETY RULES

- .1 Notwithstanding the requirement to abide by federal and provincial health and safety regulations, the following safety rules shall be considered minimum requirements at the work site and obeyed by all persons granted access:
 - .1 Wear personal protective equipment (PPE) appropriate to function and task on site; the minimum requirements being hard hat, reflective vest, personal flotation device if working near or over water, safety footwear and eye protection where appropriate.
 - .2 Immediately report unsafe activities, conditions, near-miss accidents, injuries and damages.
 - .3 Maintain site and storage areas in tidy condition free of hazards causing injury.
 - .4 Obey warning signs and safety tags.
- .2 Brief workers on site safety rules, and on the disciplinary measures to be taken for violation or non-compliance of such rules. Post such information on site.

1.17 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction of by the Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Departmental Representative will stop Work if non-compliance of health and safety regulations is not corrected in a timely manner.

1.18 INCIDENT REPORTING

- .1 Investigate and immediately report to Departmental Representative incidents that:
 - .1 Are Near Misses.
 - .2 Require reporting to Provincial Department of Occupational Safety and Health, Workers' Compensation Board or to other regulatory agency.
 - .3 Medical aid injuries.
 - .4 Cause property damage,
 - .5 Cause interruption to Facility operations that were unforeseen and were not planned for,
 - .6 Required notification to Workers Compensation Board or other regulatory agencies as stipulated by applicable regulations.

- .2 Submit report in writing.

1.19 HAZARDOUS PRODUCTS

- .1 Comply with requirements of Workplace Hazardous Materials Information Systems (WHMIS).
- .2 Keep MSDS data sheets on site. Provide copies of all data sheets to Departmental Representative upon receipt of materials on site.
- .3 Post all MSDS data sheets on site, in a common area, visible to workers.

1.20 BLASTING

- .1 Blasting or other use of explosives is not permitted.

1.21 POWDER ACTUATED DEVICES

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

1.22 CONFINED SPACES

- .1 Abide by occupational health and safety regulations regarding work in confined spaces.
- .2 Safety for Inspectors:
 - .1 Provide PPE and training to Departmental Representative and other persons who require entry into confined spaces to perform inspections.
 - .2 Be responsible for efficacy of equipment and safety of persons during their entry and occupancy in the confined space.

1.23 POSTING OF DOCUMENTS

- .1 Post documents indicated herein and as required by Authority having jurisdiction.

1.24 RECORDS ON SITE

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on Work site in accordance with Acts and Regulations of Province having jurisdiction.
- .2 Post other documents as specified herein, including:
 - .1 Site specific Health and Safety Plan.
 - .2 WHMIS data sheets.
 - .3 Incident reports.
 - .4 Tool box and safety meeting minutes.
- .3 Make available to Departmental Representative, or authorized safety representative, for inspection upon request.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 74 21 - Waste Management and Disposal
- .2 Section 35 20 23 – Underwater Excavation

1.2 REFERENCES

- .1 WHMIS: Workplace Hazardous Materials Information System, Health Canada.
- .2 Transportation of Dangerous Goods Act. Transport Canada amended 2011-11-09.
- .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 AWPA: 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 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.
- .3 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.

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 materials. Immediately clean any spillage and soils.
- .5 Before commencement of work, advise a 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.

- .6 Machinery is not allowed in water. Refer to 1.6 for equipment requirements that may come in contact with water.

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 meter buffer zone of watercourses and wetlands. Do not fuel or lubricate equipment within this 30 meter 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.
- .8 If using a floating barge, the following mitigation measures should be adhered to:
 - .1 Vessels should be compliant with all Canada Shipping Act, 2001, requirements for inspection, which includes certification of the vessel and adequate training and appropriate certification of competency for the operator.
 - .2 Ensure that all vessels will have procedures in place to ensure safeguards against marine pollution: awareness training of all employees, means of retention of waste oil on board and discharge to shore based reception facilities, capacity of responding to and clean-up of accidental spill caused by vessels involved in any particular part of the project.
 - .3 Onsite crews must have emergency spill clean-up equipment, adequate for the activity involved, on-site. Spill equipment will include, as a minimum, at least one 250 L (i.e. 55 gallon) overpack spill kit containing items to prevent a spill

from spreading; absorbent booms, pillows, and mats; rubber gloves; and plastic disposal bags. All spills or leaks must be promptly contained, cleaned up, and reported to the 24-Hour Environment Emergencies Report System (1-800-565-1633).

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 EXCAVATED MATERIAL

- .1 All stockpiled soil must be dyked (complete with silt fencing) to prevent erosion and release of sediment laden water.
- .2 If any material is excavated during the proposed project activities then the Departmental Representative must be consulted to identify an appropriate stockpile location for the excavated material to ensure the material, or any part of the material, does not re-enter any waterbody.
- .3 Excavated material shall be tested if it is to leave DFO-SCH property. If testing of material is required the cost will be the responsibility of the Crown.

1.9 WATER QUALITY

- .1 During construction activities, a floating silt curtain and/or silt boom must be installed around the work site to prevent any suspended solids and/or debris from entering into the adjacent water body. The floating silt curtain must be installed before the commencement of any work activity.
 - .1 The silt curtains will be measured for payment as per Section 01 10 10.
 - .2 The silt curtain must be marked at 10m intervals with 0.4m yellow buoys.
 - .3 The silt curtain is not to be in the path of any vessels.
- .2 Water contamination by preservative treated wood:

- .1 Preservative treated lumber and timber, whether plant or site treated, shall be cured for a minimum of 30 days from date of the treatment application before their installation in areas which will be in contact with the water.
 - .2 Do not cut treated wood lumber over the surface of a watercourse or wetland.
 - .3 Do not use liquid applied preservative products over the surface of a watercourse or wetland.
 - .4 Wood treated with Chromate Copper Arsenate (CCA) or Ammoniac Copper Zinc Arsenate (ACZA) must be CSA or AWPAs approved.
 - .5 Do not use timber and lumber treated with creosote, petroleum and pentachlorophenol for any part of the Work.
- .3 Visually monitor the water turbidity of the surrounding areas adjacent to the work and up to 200 meters.
 - .1 Should excessive change occur in the turbidity beyond the 200 meters which differs from existing conditions of the surrounding water bodies, such as a distinct colour difference; stop the work and notify the Departmental Representative to obtain appropriate mitigation measures to be followed.
 - .4 Any construction debris entering the marine environment will be immediately retrieved when it is safe to do so.
 - .5 The construction material used must be clean and non-toxic (free of fuel, oil, grease, and/or any contaminants).
 - .6 The Contractor shall develop, submit for review and implement an Erosion and Sediment Control Plan.

1.10 SOCIOECONOMIC RESTRICTIONS

- .1 Must 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 Equip 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.
- .4 Adequate signage and safety measures must be supplied during transportation of materials and equipment to the harbour.

1.11 BIRD AND BIRD HABITAT

- .1 Become knowledgeable with and abide by the Migratory Birds Convention Act (MBCA) in regards to the protection of migratory birds, their eggs, nests and their young encountered on site and in the vicinity.
- .2 Minimize disturbance to all birds on site and adjacent areas during the entire course of the Work.
- .3 Do not approach concentrations of seabirds, waterfowl and shorebirds when anchoring equipment, accessing wharves or ferrying supplies.
- .4 During night time work, position flood lights in opposite direction of nearby bird nesting habitat.

- .5 Do not use beaches, dunes and other natural previously undisturbed areas of the site to conduct work unless specifically approved by the Departmental Representative.
- .6 Should nests of migratory birds in wetlands be encountered during work, immediately notify Departmental Representative for directives to be followed.
 - .1 Do not disturb nest site and neighboring vegetation until nesting is completed.
 - .2 Minimize work immediately adjacent to such areas until nesting is completed.
 - .3 Protect these areas by following recommendations of Canadian Wildlife Service.
- .7 Ensure that food scraps and garbage are not left at the work site.
- .8 Project vehicles will keep to designated project transportation routes and stay within DFO-SCH property boundaries.
- .9 No staging of vehicles or equipment/material storage will take place on any beaches, wetlands or dunes, unless otherwise advised, via permit, by Departmental Representative. The project footprint will not encroach/impact these abovementioned areas.

1.12 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 Scrape and remove heavy accumulation of mud and dispose appropriately.
 - .2 Wash all surfaces of equipment by use of a pressurized fresh water, supplied by contractor.
 - .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 Checks 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 meter 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 down of all equipment to illustrate mitigation measures undertaken against fish habitat contamination by alien species.
- .2 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.

1.13 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.

1.14 FIRES

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 01 77 00 – Closeout Procedures
- .3 Section 01 78 00 – Closeout Submittals

1.2 DEFINITIONS

- .1 Quality Control (QC): The process of checking specific product or services to determine if they comply with relevant quality standards and identify ways to eliminate causes of unsatisfactory product or service performed.
- .2 Quality Assurance (QA): The process of ensuring that the Contractor's Quality Management Plan (QMP) (QC, non-conformances, etc.) is being followed. The results of the QA are provided as feedback to both the Contractor and the Departmental Representative. Where required, the Contractor shall implement changes to the project based on the feedback received from the QA process.

1.3 INSPECTION

- .1 Allow Departmental Representative adequate time and access to Work. If part of Work is in preparation at locations other than Place of Work, allow time and access to such Work whenever it is in progress.
- .2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, until particular inspections or tests have been fully and satisfactorily completed and until such time as Departmental Representative gives permission to proceed. Pay costs to uncover and make good such Work.
- .4 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.
- .5 The Departmental Representative shall participate in the taking of survey of all quantities with the Contractor responsible to complete the surveys in the presence of the Departmental Representative.
- .6 The Contractor shall provide underwater video to verifying acceptance of the following items:
 - .1 All steel sheet pile repairs.
 - .2 The final condition of the bottom of the concrete copewall.

1.4 INDEPENDENT INSPECTION AGENCIES

- .1 Independent Inspection/Testing Agencies will be engaged and coordinated by Departmental Representative for purpose of inspecting and/or testing portions of Work. These agencies include, but are not limited to, concrete testing, coating testing and inspection, aggregate tests, compaction tests. Cost of such services will be borne by Departmental Representative. The Contractor remains responsible for:
 - .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
 - .2 Inspection and testing performed exclusively for Contractor's convenience.
 - .3 Mill tests and certificates of compliance.
 - .4 Tests as specified within various sections designated to be carried out by Contractor under the supervision of Departmental Representative.
- .2 Provide equipment and materials required for executing inspection and testing by appointed agencies.
- .3 Employment of inspection/testing agencies does not relax responsibility of Contractor to perform Work in accordance with Contract Documents.
- .4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no additional cost to Contractor. Contractor shall pay costs for retesting and re-inspection.

1.5 ACCESS TO WORK

- .1 Allow inspection/testing agencies access and required time to Work, off site manufacturing and fabrication plants.
- .2 Co-operate to provide reasonable facilities for such access.
- .3 Make good work disturbed by inspections and tests.

1.6 PROCEDURES

- .1 Notify appropriate agency and Departmental Representative sufficiently in advance of when work is ready for tests, in order for Departmental Representative to make attendance arrangements with Testing Agency. When directed by Departmental Representative, notify such agency directly.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Deliver in required quantities to Testing Agency. Submit with reasonable promptness and in an orderly sequence to not cause delays in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space on site for Testing Agency's exclusive use to store equipment and cure test samples.

1.7 REJECTED WORK

- .1 Remove defective Work, whether result of poor workmanship, use of defective or damaged products and whether incorporated in Work or not, which has been rejected by

Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

- .2 Make good damages to existing or new work, including work of other Contracts, resulting from removal or replacement of defective work.
- .3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Departmental Representative will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Departmental Representative.

1.8 TESTING BY CONTRACTOR

- .1 Provide all necessary instruments, equipment and qualified personnel to perform tests designated as Contractor's responsibilities herein or elsewhere in the Contract Documents.

1.9 REPORTS

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

1.10 TESTS AND MIX DESIGNS

- .1 Furnish test results and mix designs as requested and as specified in relevant Technical Specification section.
- .2 Cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by Departmental Representative and may be authorized as recoverable.

1.11 MILL TESTS

- .1 Submit mill test certificates as required of specification Sections or as requested by Departmental Representative.

END OF SECTION

Part 1 General

1.1 SITE ACCESS AND PARKING

- .1 Contractor's access to project site as well as parking facilities for equipment and workers will be by arrangement with the Harbour Authority.
- .2 The Contractor is advised that while parking facilities for workers and subcontractors will be on DFO-SCH property, such parking facilities may be removed from the actual site of the work. In any case, follow all instructions from the Harbour Authority in regard to parking facilities.
- .3 Parking facilities at site are limited. Make arrangements elsewhere for Contractor's vehicles including those of subcontractors and workers by consultation with the Harbour Authority.
- .4 Build and maintain temporary access roads and provide snow removal and dust control during period of work.
- .5 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. This will be strictly enforced.

1.2 CONTRACTOR'S SITE OFFICE

- .1 Be responsible for and provide own site office, if required, including electricity, heat, lights, and telephone. A laydown area for a site office and material storage has been identified on the tender drawings.

1.3 MATERIAL STORAGE

- .1 Material storage space on site is limited. Coordinate delivery to minimize storage period on site before being needed for incorporation into work.

1.4 SITE ENCLOSURES

- .1 Provide temporary fence to enclose various construction areas of work site.
- .2 Erect plastic mesh fence constructed as follows:
 - .1 1200 mm height, constructed of high-density polyethylene mesh fence fabric, orange in color.
 - .2 Supported by steel T-bar posts or other similar framing, of sufficient quantity, adequate spacing and set firmly in ground to secure fence against sags.
 - .3 Inspect fence regularly, repairing sags and damaged sections.
 - .4 Incorporate within fence one operable truck gate and one pedestrian gate.
- .3 Make all gates lockable and provide keyed padlocks.

- .4 Obtain Departmental Representative's approval beforehand of location and layout of all temporary fence enclosures.
- .5 Provide battery powered lanterns around the perimeter of the site enclosure to clearly mark its location at night.
- .6 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.

1.5 SANITARY FACILITIES

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.6 ENCLOSURE OF STRUCTURE

- .1 Design enclosures to withstand wind pressure, tides, ice and snow loading.

1.7 POWER AND LIGHTING

- .1 Power supply may be available and may be provided for construction usage, pending negotiation for same with the Harbour Authority.
 - .1 Make arrangements for the use of such services through the Harbour Authority and negotiate fee to use the service prior to commencing the work.
 - .2 DFO/SCH and the Harbour Authority will designate and approve each location of existing power source to which connections can be made to obtain temporary power service.
 - .3 Connect to existing power supply in accordance with Canadian Electrical Code.
- .2 Provide and maintain temporary lighting to conduct work and to provide temporary lighting for the structures as requested by a Departmental Representative.
 - .1 This may include areas outside of work areas if the lighting in those areas has been compromised.
 - .2 Ensure illumination level is not less than 162 lx in all locations. Temporary lighting shall be considered incidental to the work.
- .3 Power used for heating and hoarding will require self-contained power supply units supplied by the contractor. No connection will be available from Harbour Authority services for this power requirement.

1.8 WATER SUPPLY

- .1 Water supply may be available on site and may be provided for construction usage, pending negotiation with the Harbour Authority. Make arrangements for the use and transportation of such services to work area through the Harbour Authority.

1.9 CONSTRUCTION SIGNS AND NOTICES

- .1 Contractor or subcontractor advertisement signboards are not permitted on site.

- .2 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).
- .3 Maintenance and Disposal of Site Signs:
 - .1 Maintain approved signs and notices in good condition for duration of project and dispose of offsite upon completion of project or earlier if directed by Departmental Representative.

1.10 REMOVAL OF TEMPORARY FACILITIES

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 01 35 29.06 – Health and Safety
- .3 Section 01 35 43 – Environmental Procedures
- .4 Section 01 56 00 – Temporary Barriers and Enclosures

1.2 REFERENCES

- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
 - .2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
- .2 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA-0121-M1978 (R2003), Douglas Fir Plywood.
 - .3 CAN/CSA-S269.2-M1987 (R2003), Access Scaffolding for Construction Purposes.
 - .4 CAN/CSA-Z321-96 (R2001), Signs and Symbols for the Occupational Environment.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit shop drawings for all temporary structures which are required to be engineered. Shop drawings submitted to bear signature and stamp of qualified professional engineer registered or licensed in the Province the work is being completed.

1.4 INSTALLATION AND REMOVAL

- .1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.
- .2 Identify areas which must be gravelled to prevent tracking of mud.
- .3 Indicate use of supplemental or other staging area.
- .4 Provide construction facilities in order to execute work expeditiously.
- .5 Remove from site all such work after use.

1.5 SCAFFOLDING

- .1 Scaffolding in accordance with CAN/CSA-S269.2.

- .2 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms and temporary stairs as required.

1.6 HOISTING

- .1 Provide, operate and maintain hoists required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for their use of hoists.
- .2 Hoists and cranes to be operated by qualified operator. Cranes must be certified and inspected on a regular basis.

1.7 SITE STORAGE/LOADING

- .1 Confine work and operations of employees to an area agreed to by the Departmental Representative. Do not unreasonably encumber premises with products.
- .2 Do not load or permit to load existing structures or any part of Work with weight or force that will endanger existing structures or the new Work.
- .3 The capacity of existing structures is unknown.

1.8 CONSTRUCTION PARKING

- .1 Parking will be permitted where permitted by the Harbour Authority.
- .2 Provide and maintain adequate access to project site.
- .3 Keep parking areas clean and maintain during period of Contract.

1.9 SECURITY

- .1 If deemed necessary by the contractor, provide, and pay for responsible security personnel to guard site and contents of site after working hours and during holidays.

1.10 OFFICES

- .1 Provide office heated to 22 degrees C, lighted 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table.
- .2 Provide marked and fully stocked first-aid case in a readily available location.
- .3 Subcontractors shall provide their own offices as necessary. Offices must be located within the laydown area identified on the drawings.

1.11 EQUIPMENT, TOOL AND MATERIALS STORAGE

- .1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- .2 Locate materials not required to be stored in weatherproof sheds on site in the laydown area.

1.12 SANITARY FACILITIES

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

- .2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.13 CLEAN-UP

- .1 Remove construction debris, waste materials, packaging material from work site daily.
- .2 Clean dirt or mud tracked onto paved or surfaced roadways.
- .3 Make good any road surfaces as good or better than their original condition upon completion of the work.
- .4 Store materials resulting from demolition activities that are salvageable.
- .5 Stack stored new or salvaged material not in construction facilities.

Part 2 Products

Not Used.

Part 3 Execution

3.1 GENERAL

- .1 Construct and maintain construction facilities in accordance with applicable Sections contained in these specifications.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 35 29.06 – Health and Safety
- .2 Section 01 74 21 – Construction/Demolition Waste Management and Disposal
- .3 Section 02 41 16 – Selective Site Demolition

1.2 REFERENCES

- .1 Canadian General Standards Board (CGSB)
 - .1 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
 - .2 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
- .2 Canadian Standards Association (CSA International)
 - .1 CSA-O121-M1978(R2003), Douglas Fir Plywood.
- .3 PEI Department of Transportation, Infrastructure & Energy (PEITIE)
 - .1 PEI Temporary Workplace Traffic Control Manual (TWTTCM)

1.3 INSTALLATION AND REMOVAL

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

1.4 HOARDING

- .1 Erect temporary site enclosures when and where required using minimum 38 x 89mm construction grade lumber framing at 600mm centres and 1200 x 2400 x 13mm exterior grade fir plywood to CSA O121.
- .2 Apply plywood panels vertically as indicated flush and butt jointed.
- .3 Provide one or two lockable truck entrance gates and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys.
- .4 Erect and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law.
- .5 Paint public side of site enclosure in selected colours with one coat primer to CAN/CGSB 1.189 and one coat exterior paint to CGSB 1.59. Maintain public side of enclosure in clean condition.
- .6 Erect temporary site enclosure where and when required using new 1.2m high snow fence wired to rolled steel "T" bar fence posts spaced at 2.4 m on centre. Provide one lockable truck gate. Maintain fence in good repair.

1.5 GUARD RAILS AND BARRICADES

- .1 Provide secure, rigid guard rails and barricades around deep excavations, and open edges of structures or as indicated in Contract Documents. Provide as required by governing authorities and as indicated.

1.6 WEATHER ENCLOSURES

- .1 Provide weather tight closures where and when required to facilitate construction operations.
- .2 Design enclosures to withstand wind pressure and snow loading.

1.7 DUST TIGHT SCREENS

- .1 Provide dust tight screens to localize and control dust generating activities, and for protection of workers and the environment.
- .2 Maintain and relocate protection until such work is complete.

1.8 ACCESS TO SITE

- .1 Provide and maintain access roads as may be required for access to Work.

1.9 FIRE ROUTES

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

1.10 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Be responsible for damage incurred.

1.11 WASTE MANAGEMENT AND DISPOSAL

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

END OF SECTION

Part 1 General

1.1 PRECEDENCE

- .1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

1.2 REFERENCES

- .1 Conform to these reference standards, in whole or in part as specifically requested in specifications.
- .2 If there is question as to whether products or systems are in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.
- .3 Cost for such testing will be borne by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.
- .4 Conform to latest date of issue of referenced standards in effect on date of submission of Tenders, except where specific date of issue is specifically noted.

1.3 QUALITY

- .1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .2 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .3 Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.
- .4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .5 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations.

1.4 AVAILABILITY

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

1.5 STORAGE, HANDLING AND PROTECTION

- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- .6 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
- .8 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.
- .9 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.6 TRANSPORTATION

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

1.7 MANUFACTURER'S INSTRUCTIONS

- .1 Unless otherwise indicated in specifications install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental Representative will establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

1.8 QUALITY OF WORK

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.

- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.

1.9 CO-ORDINATION

- .1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.10 REMEDIAL WORK

- .1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.
- .2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.11 LOCATION OF FIXTURES

- .1 Consider location of fixtures, outlets, and electrical items indicated as approximate.
- .2 Inform Departmental Representative of conflicting installation. Install as directed.

1.12 PROTECTION OF WORK IN PROGRESS

- .1 Prevent overloading of parts of new and existing structures. Do not cut, drill or sleeve load bearing structural members, unless specifically indicated without written approval of Departmental Representative.

1.13 EXISTING UTILITIES

- .1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, pedestrian and vehicular traffic.
- .2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 78 00 – Closeout Submittals.

1.2 REFERENCES

- .1 Owner's identification of existing survey control points and property limits.

1.3 SURVEY REFERENCE POINTS

- .1 Locate, confirm and protect working/datum points prior to starting site work.
- .2 Make no changes or relocations without prior written notice to Departmental Representative.
- .3 Report to Departmental Representative when reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations.

1.4 SURVEY REQUIREMENTS

- .1 Establish lines and levels, locate and lay out, by instrumentation.

1.5 EXISTING SERVICES

- .1 Before commencing work, establish location and extent of active (or previously abandoned) service lines in area of Work and notify Departmental Representative of findings.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit name and address of Surveyor to Departmental Representative for approval.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

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

1.2 PROJECT CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Harbour Authority or other Contractors.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .3 Clear snow and ice from access to site, bank/pile snow in designated areas only.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide on-site containers for collection of waste materials and debris.
- .6 Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .7 Dispose of waste materials and debris off site.
- .8 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .9 Provide adequate ventilation during use of volatile or noxious substances.

1.3 FINAL CLEANING

- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .3 Remove waste products and debris including that caused by other Contractors, and leave Work clean and suitable for occupancy.
- .4 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .5 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .6 Inspect finishes and ensure specified workmanship and operation.
- .7 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .8 Remove dirt and other disfiguration from exterior surfaces.
- .9 Sweep and wash clean finished paved and concreted areas within the work site.
- .10 Clean drainage systems.

- .11 Remove debris and surplus materials from site.
- .12 Remove snow and ice from access to site.

1.4 WASTE MANAGEMENT AND DISPOSAL

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

END OF SECTION

Part 1 General

1.1 WASTE MANAGEMENT GOALS

- .1 Prior to start of Work conduct meeting with Departmental Representative to review and discuss DFO-SCH Waste Management Plan and Goals.
- .2 Accomplish maximum control of solid construction waste.
- .3 Preserve environment and prevent pollution and environmental damage.

1.2 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 02 41 13 – Selective Site Demolition

1.3 REFERENCES

- .1 PEI Environmental Protection Act
- .2 PEITIE Standard Specifications

1.4 DEFINITIONS

- .1 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
- .2 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
- .3 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- .4 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:
 - .1 Salvaging reusable materials from re-modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.
 - .2 Returning reusable items including pallets or unused products to vendors.
- .5 Salvage: removal of structural and non-structural structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
- .6 Separate Condition: refers to waste sorted into individual types.
- .7 Source Separation: act of keeping different types of waste materials separate beginning from the point they became waste.
- .8 Waste Audit (WA): detailed inventory of estimated quantities of waste materials that will be generated during construction, demolition, deconstruction and/or renovation. Involves quantifying by volume/weight amounts of materials and wastes that will be reused, recycled or landfilled.

1.5 STORAGE, HANDLING AND PROTECTION

- .1 Store, materials to be reused, recycled and salvaged.
- .2 Unless specified otherwise, materials for removal become Contractor's property.
- .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.
- .5 Provide on-site facilities and containers for collection and storage of reusable and recyclable materials.
- .6 Separate and store materials produced during project in designated areas.
- .7 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated processing facilities.
 - .1 On-site source separation is required.
 - .2 Remove co-mingled materials to off-site processing facility for separation.
 - .3 Obtain waybills, receipts and/or scale tickets for separated materials removed from site.

1.6 DISPOSAL OF WASTES

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of waste, volatile materials, mineral spirits, oil, paint thinner and the like into waterways, storm, or sanitary sewers.
- .3 Keep records of construction waste including:
 - .1 Number and size of bins.
 - .2 Waste type of each bin.
 - .3 Total tonnage generated.
 - .4 Tonnage reused or recycled.
 - .5 Reused or recycled waste destination.
- .4 Remove materials from deconstruction as deconstruction/disassembly Work progresses.
- .5 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in the waste audit.
- .6 Any creosote or other treated timbers removed from the work to be disposed of in a Provincial approved manner.
- .7 The Contractor shall develop, submit for review and implement a Waste Management Plan and Certification of Material Diversion.

1.7 USE OF SITE FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises.
- .2 Maintain security measures established by DFO-SCH and The Harbour Authority

1.8 SCHEDULING

- .1 Co-ordinate Work with other activities at site to ensure timely and orderly progress of Work.

Part 2 Products

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 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Clean up Work area as work progresses.
- .2 Remove tools and waste materials on completion of Work and leave work area in clean and orderly condition.
- .3 Source separate materials to be reused/ recycled into specified sort areas.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 78 00 - Closeout Submittals.

1.2 INSPECTION AND DECLARATION

- .1 Acceptance of Work Procedures:
 - .1 Contractor's Inspection:
 - .1 Coordinate and perform, in concert with subcontractors, an inspection and check of all Work. Identify and correct deficiencies, defects, repairs and perform outstanding items as required to complete work in conformance with Contract Documents.
 - .2 Notify Departmental Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
 - .3 Request Departmental Representative's Inspection.
 - .2 Departmental Representative's Inspection:
 - .1 Accompany Departmental Representative during all substantial and final inspections of the Work.
 - .2 Contractor to correct Work accordingly.
 - .3 Completion Tasks: submit written certificates in English that tasks have been performed as follows:
 - .1 Work: completed and inspected for compliance with Contract Documents.
 - .2 Defects: corrected and deficiencies completed.
 - .3 Work: complete and ready for final inspection.
 - .4 Final Inspection:
 - .1 When completion tasks are done, request final inspection of Work by Departmental Representative and Contractor.
 - .2 When Work is incomplete according to Departmental Representative, complete outstanding items and request re-inspection.
 - .5 Declaration of Substantial Performance:
 - .1 When Departmental Representative considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.
 - .2 Note that Departmental Representative will not issue a Certificate of Substantial Performance of the work until such time that Contractor performs following work and turns over the specified documents:
 - .1 Project record as-built documents;
 - .2 Reports resulting from designated tests;
 - .3 Commissioning reports;
 - .6 Final Payment:

- .1 When Departmental Representative considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.
- .2 When Work is deemed incomplete by Departmental Representative, complete outstanding items and request re-inspection.
- .7 Payment of Holdback:
 - .1 After issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.
- .8 Notify Departmental Representative in writing when deficiencies from Contractor's inspection have been rectified and that Work is deemed to be complete and ready for Departmental Representative's inspection of the completed work.
- .9 Address defects, faults and outstanding items of work identified by such inspections.
- .10 Advise Departmental Representative when all deficiencies identified have been rectified.

1.3 FINAL CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment. Remove waste and surplus materials, rubbish and construction facilities from the site in accordance with applicable sections of these specifications.
- .2 Waste Management: separate waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 01 45 00 – Quality Control
- .3 Section 01 71 00 – Examination and Preparation
- .4 Section 01 77 00 – Closeout Procedures

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide As-built documents and samples.

1.3 FORMAT

- .1 Organize data as instructional manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
- .3 When multiple binders are used correlate data into related consistent groupings.
 - .1 Identify contents of each binder on spine.
- .4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5 Arrange content by systems, under Section numbers and sequence of Table of Contents.
- .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .7 Text: manufacturer's printed data, or typewritten data.
- .8 Drawings: provide with reinforced punched binder tab.
 - .1 Bind in with text; fold larger drawings to size of text pages.

1.4 CONTENTS - PROJECT RECORD DOCUMENTS

- .1 Table of Contents for Each Volume: provide title of project;
 - .1 Date of submission; names.
 - .2 Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.
 - .3 Schedule of products and systems, indexed to content of volume.
- .2 For each product or system:
 - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

- .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Typewritten Text: as required to supplement product data.
 - .1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

1.5 AS -BUILT DOCUMENTS AND SAMPLES

- .1 Maintain at site for Departmental Representative one record copy of:
 - .1 Contract Drawings (Departmental Representative will provide a full size copy of the drawings to be used as Red-Line set of as-builts).
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to Contract.
 - .5 Reviewed shop drawings, product data, and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Departmental Representative.

1.6 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

- .1 Record information on set of opaque drawings.
- .2 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
- .3 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:
 - .1 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface features.
 - .2 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .3 Field changes of dimension and detail.
 - .4 Changes made by change orders.

- .5 Details not on original Contract Drawings.
- .6 References to related shop drawings and modifications.
- .4 Specifications: legibly mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.
- .5 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

1.7 WARRANTIES AND BONDS

- .1 Assemble approved information in binder, submit upon acceptance of work and organize binder as follows:
 - .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
 - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
 - .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
 - .4 Verify that documents are in proper form, contain full information, and are notarized.
 - .5 Co-execute submittals when required.
 - .6 Retain warranties and bonds until time specified for submittal.
- .2 Except for items put into use with Department Representative's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.

END OF SECTION

Part 1 General

1.1 DESCRIPTION OF WORK

- .1 This Section includes but is not limited to the following:
 - .1 All sitework, demolition and removals as required to complete the work. All items to be verified prior to submission of a tender.

1.2 RELATED SECTIONS

- .1 Refer to Section 01 33 00 for Submittal Procedures.

1.3 SUBMISSIONS

- .1 Methodology:
 - .1 Provide methodology for carrying out the major components of the work.
 - .2 Provide submissions in accordance with Section 01 33 00.

1.4 PROTECTION

- .1 Prevent movement, settlement, or damage of adjacent structures. Provided bracing and shoring as required. In event of damage, immediately replace such items or make repairs to approval of a Departmental Representative and at no additional cost.
- .2 Prevent debris from entering harbour and creating navigational hazards.
- .3 All damage to existing structures, roadways, etc., not specified for removal to be repaired at the Contractor's cost to the satisfaction of the Departmental Representative.
- .4 Do not load or travel on any structures other than those designated for replacement. Capacity of existing structures is unknown.

1.5 MEASUREMENT FOR PAYMENT

- .1 Refer to Section 01 10 10 General Instructions for measurement for payment.
- .2 Item shall include demolitions, selective demolitions, removals, transportation, disposal, environmental protective measures, and site cleanup.

Part 2 Products

2.1 Not Used

Part 3 Execution

3.1 PREPARATION

- .1 Inspect site and verify with a Departmental Representative the items designated for removal and items to be preserved.
- .2 Do not disturb adjacent structures designated to remain in place.

3.2 REMOVAL

- .1 Remove items indicated. These items include but are not limited to:
 - .1 The existing concrete deck;
 - .2 The existing timber curbs and associated fasteners;
 - .3 The existing ladders and mooring cleats and associated fasteners;
 - .4 The existing fills inside/adjacent to the structure to El. +1.25 meters (or 200 mm below the existing tie-rod elevation).
- .2 At end of each day's work, leave work in safe condition so no part is in danger of toppling or failing.
- .3 Excavate to extents and dimensions indicated on the drawings.
- .4 Do not leave the structure open or exposed to the elements at the end of each day. This is of particular importance with regard to wave exposure.

3.3 DISPOSAL OF MATERIAL

- .1 All materials to be disposed of at provincially operated land fill facility.
- .2 If applicable, treated timber materials to be disposed of at provincially operated land fill facility. It is the contractor's responsibility to verify the location of the facility.

3.4 RESTORATION

- .1 Upon completion of work, remove debris, trim surfaces, and leave work site clean.
- .2 Reinstate areas and existing works outside areas of demolition to conditions that existed prior to commencement of work. Match condition of adjacent, undisturbed areas.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

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

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA A23.4, Precast Concrete – Materials and Construction
 - .3 CSA-O86-14, Engineering Design in Wood.
 - .4 CSA O121-08(R2013), Douglas Fir Plywood.
 - .5 CSA O151-09 (R2014), Canadian Softwood Plywood.
 - .6 CSA O153-13, Poplar Plywood.
 - .7 CAN/CSA-O325-07(R2012), Construction Sheathing.
 - .8 CSA O437 Series-93(R2011), Standards for OSB and Waferboard.
 - .9 CAN/CSA-S269.1-1975 (R2003), Falsework for Construction Purposes
 - .10 CAN/CSA-S269.3-M92(R2013), Concrete Formwork, National Standard of Canada

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit shop drawings for formwork and falsework.
 - .1 Submit drawings and calculations stamped and signed by Professional Engineer registered or licensed in the Province where the work is being completed at least four (4) weeks before construction. The submission is intended for information purposes only and shall in no way relieve the Contractor of full responsibility to carry out work related in accordance with CSA S269.3 for Concrete Formwork and CSA S269.1 for Falsework.
- .3 Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, and materials, arrangement of joints, special architectural exposed finishes, ties, liners, and locations of temporary embedded parts. 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 formwork Engineer.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Store and manage hazardous materials in accordance with jurisdictional requirements.
- .2 Deliver, handle and store formwork materials to prevent weathering, warping or damage detrimental to the strength of the materials or to the surface to be formed.
- .3 Ensure that formwork surfaces which will be in contact with concrete are not contaminated by foreign material. Handle and erect the fabricated formwork so as to prevent damage.
- .4 Waste Management and Disposal:
 - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .2 Place materials defined as hazardous or toxic waste in designated containers.
 - .3 Ensure emptied containers are sealed and stored safely for disposal away from children.
 - .4 Use sealers, form release and stripping agents that are non-toxic, biodegradable and have zero or low volatile organic compounds (VOC's).

1.5 MEASUREMENT FOR PAYMENT

- .1 Refer to Section 01 10 10 General Instructions for measurement for payment.

Part 2 Products

2.1 MATERIALS

- .1 Formwork materials:
 - .1 Use wood and wood product formwork materials to CAN/CSA O121, CAN/CSA-O86.
 - .2 Formwork shall be constructed from lumber devoid of warped defects in order to achieve a face alignment free of distortion. This shall apply to all panel forms including prefabricated boards, plywood and steel panels.
 - .3 Formwork on exposed concrete surfaces shall be new or like new to achieve a quality aesthetically pleasing finish.
- .2 Form ties:
 - .1 Use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface. Holes to be filled with non-shrink grout.
 - .2 Form tie components which remain embedded in concrete are to be galvanized or non-metallic. Dissimilar metals which are in contact must be separated by dense tape barrier.
- .3 Form release agent: non-toxic, biodegradable, low VOC. Form release agents must be compatible with waterproofing systems where applicable.
- .4 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 Do not place shores and mud sills on frozen ground.
- .4 Provide site drainage to prevent washout of soil supporting mud sills and shores.
- .5 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA-A23.1/A23.2.
- .6 Align form joints and make watertight.
 - .1 Keep form joints to minimum.
- .7 Use 25 mm chamfer strips on external corners and/or 25 mm fillets at interior corners, joints, unless specified otherwise.
- .8 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.
- .9 Construct forms for architectural concrete as indicated.
 - .1 Joint pattern not necessarily based on using standard size panels or maximum permissible spacing of ties.
- .10 Built in anchors, sleeves, and other inserts required to accommodate Work specified in other sections.
 - .1 Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including concrete texturing.
 - .2 Anchors and inserts cast into the concrete shall be non-metallic or galvanized metal and either be isolated from dissimilar metals by either a 30 mm clear spacing or 'Denso' tape barrier on the formwork anchors / inserts.
- .11 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.

3.2 REMOVAL AND RESHORING

- .1 Notify Departmental Representative prior to form removal.
- .2 Form removal times are dependent on proper curing in accordance with CAN/CSA-A23.1 and CAN/CSA-S269.3. Provide written evidence of concrete strength to the Departmental Representative 24 hours prior to form removal to show the suitable strength has been achieved. Contractor shall pay for the concrete cylinder strength tests to demonstrate concrete strength prior to form removal.
- .3 Remove formwork when concrete has reached 70% of its design strength and replace immediately with adequate reshoring (if required). No vehicle loading or backfilling shall take place until concrete reaches design strength, unless otherwise approved in writing by a Departmental Representative.
- .4 If formwork is used to aid curing, it shall not be removed until seven days after the concrete placement.

- .5 Re-use formwork and falsework subject to requirements of CSA-A23.1/A23.2.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 01 45 00 – Quality Control
- .3 Section 03 10 00 – Concrete Forming and Accessories
- .4 Section 03 30 00 – Cast-in-Place Concrete

1.2 REFERENCES

- .1 American Concrete Institute (ACI)
 - .1 SP-66-04, ACI Detailing Manual 2004.
 - .1 ACI 315-99, Details and Detailing of Concrete Reinforcement.
 - .2 ACI 315R-04, Manual of Engineering and Placing Drawings for Reinforced Concrete Structures.
- .2 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A143/A143M-07 (2014), Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
 - .2 ASTM A780 / A780M 09 (2015), Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .2 CSA-A23.3-14, Design of Concrete Structures.
 - .3 CSA-A23.4, Precast Concrete – Materials and Construction
 - .4 CAN/CSA-G30.18-09, Carbon Steel Bars for Concrete Reinforcement, A National Standard of Canada.
 - .5 CSA-G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .6 CAN/CSA-G164-M92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles, A National Standard of Canada.
 - .7 CSA W186-M1990 (R2012), Welding of Reinforcing Bars in Reinforced Concrete Construction.
 - .8 CSA S6-14, Canadian Highway Bridge Design Code
- .4 Reinforcing Steel Institute of Canada (RSIC)
 - .1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

- .2 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice and ACI 315, except as noted herein. Shop drawings are to be submitted at least four (4) weeks prior to commencing fabrication for review and approval. The Contractor retains responsibility for correctly detailing reinforcement, but the shop drawings must be approved for conformity with the design. Fabrication shall not proceed until the final approval of shop drawings. Shop drawings shall be stamped by a Professional Engineer licensed to practice in the Province in which the work is being completed.
- .3 Submit shop drawings including placing of reinforcement and indicate:
 - .1 Bar bending details as per RSIC-2004, Reinforcing Steel Manual of Standard Practice.
 - .2 Lists.
 - .3 Quantities of reinforcement.
 - .4 Sizes, spacings, locations of reinforcement and mechanical splices as specified / if approved by Departmental Representative, with identifying code marks to permit correct placement without reference to structural drawings.
 - .5 Indicate sizes, spacings and locations of chairs, spacers and hangers.
- .4 Detail lap lengths and bar development lengths to CSA-S23.3, unless otherwise indicated.
 - .1 Provide Class B tension lap splices unless otherwise indicated.

1.4 QUALITY ASSURANCE

- .1 Submit in accordance with Section 01 45 00 - Quality Control and as described in PART 2.3 - SOURCE QUALITY CONTROL.
 - .1 Mill Test Report: provide Departmental Representative with certified copy of mill test report of reinforcing steel, minimum 4 weeks prior to beginning reinforcing work.
 - .2 Submit in writing to Departmental Representative proposed source of reinforcement material to be supplied.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

1.6 MEASUREMENT FOR PAYMENT

- .1 Refer to Section 01 10 10 General Instructions for measurement for payment.

Part 2 Products

2.1 MATERIALS

- .1 Substitute different size bars only if permitted in writing by Departmental Representative.
- .2 Reinforcing steel: billet steel, grade 400W (weldable), deformed bars to CAN/CSA-G30.18, unless indicated otherwise.
- .3 Chairs, bolsters, bar supports, spacers: to CSA-A23.1/A23.2.
- .4 Mechanical splices:
 - .1 The use of mechanical rebar splices shall be subject to approval of Departmental Representative.
- .5 Wire ties: to CSA G30.3 plain, cold drawn annealed steel wire.

2.2 FABRICATION

- .1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2, ACI 315 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 Upon approval of Departmental Representative, weld reinforcement in accordance with CSA W186.
- .4 Ship bundles of bar reinforcement clearly identified in accordance with bar bending details and lists.
- .5 Do not weld reinforcing steel.

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, minimum 4 weeks prior to beginning reinforcing work.
- .2 Upon request inform Departmental Representative of proposed source of material to be supplied.

Part 3 Execution

3.1 PREPARATION

- .1 All steel reinforcing bars shall have the necessary net sectional area, and shall be cut to the exact lengths, and bent cold to the exact forms and dimensions, shown on the approved plans, or otherwise required, before being placed in position. Bending shall be accurately done, in a bending machine and no welding or heating of any bars shall be allowed, except with written approval from the Departmental Representative. All stirrups and hoops shall accurately fit the rods, and all bends shall be taken out of bars to be used as straight members.

3.2 FIELD BENDING

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

3.3 CLEANING

- .1 Clean reinforcing before placement.

3.4 PLACING REINFORCEMENT

- .1 Place reinforcing steel as indicated on placing drawings.
- .2 Prior to placing concrete, obtain Departmental Representative's approval of reinforcing material and placement.
- .3 Ensure cover to reinforcement is maintained during concrete placement.
- .4 All reinforcing bars shall be placed and held rigidly in the exact positions in the forms as shown on the approved plans, or otherwise required, and there shall be no displacement of the same by the placing and tamping of the concrete. Adjusting or moving the bars, while the concrete is being placed, shall not be permitted, unless specified on the plans.
- .5 Concrete protection required for reinforcing steel shall be in accordance with the Contract Documents, or as directed by the Departmental Representative. All bars shall be tied and properly braced to prevent displacement. No concrete shall be placed until the reinforcement, after being cleaned and placed in position, has been examined and approved by the Departmental Representative.

3.5 SURFACE CONDITION

- .1 Reinforcement (at time concrete is placed) to be free from mud, oil or other nonmetallic coatings that adversely affect bonding capacity.
- .2 Reinforcement with rust, mill scale, or combination of both to be considered as satisfactory provided minimum dimensions, including height of deformations, and mass of hand wire brushed test specimen are not less than specified requirements in applicable CSA Standards.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 01 35 29.06 – Health and Safety Requirements
- .3 Section 01 45 00 – Quality Control
- .4 Section 01 74 21 – Construction/Demolition Waste Management and Disposal
- .5 Section 03 10 00 – Concrete Forming and Accessories
- .6 Section 03 20 00 – Concrete Reinforcing

1.2 REFERENCES

- .1 ANSI/ACI 117-06, Specifications for Tolerances for Concrete Construction and Materials and Commentary.
- .2 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 C457-08, Standard Test Method for Microscopical Determination of Parameters of the Air-Void System in Hardened Concrete.
 - .4 ASTM C494/C 494M-13, Standard Specification for Chemical Admixtures for Concrete.
 - .5 ASTM C1017/C 1017M-13, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
 - .6 ASTM C1202-07, Standard Test Method for Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA A23.5, Supplementary Cementing Materials
 - .3 CSA A283-00(R2003), Qualification Code for Concrete Testing Laboratories.
 - .4 CSA S269.3-M92(R2008), Concrete Formwork.
 - .5 CAN/CSA-A3000-13, Cementitious Materials Compendium.
 - .1 CSA-A3001-13, Cementitious Materials for Use in Concrete.
 - .6 CSA S6-14, Canadian Highway Bridge Design Code

1.3 DESIGN REQUIREMENTS

- .1 Table 5-Alternative 1 – Performance: in accordance with CSA-A23.1/A23.2, and as described in Mixes of Part 2 – Products.

- .1 Concrete mixture designs shall be proportioned as normal density concrete in accordance with CSA-A23.1 latest edition, Table 5-Alternative #1. Concrete shall be proportioned using Portland cement, Type SF silica fume, fly ash, fine and coarse aggregates, air entraining, water reducing, and superplasticizing and / or set retarding admixtures. Other supplementary cementing materials may include Class F fly ash. Set retarding admixtures may be used as ambient and site conditions warrant upon approval from a Departmental Representative.

1.4 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit the following at least four (4) weeks prior to the commencing concrete work:
 - .1 Certification from the qualified independent inspection and testing company that plant, equipment and materials to be used in the concrete comply with requirements of CSA-A23.1/A23.2.
 - .2 Manufacturer's test data and certification by qualified independent inspection and testing laboratory that the following materials will meet specified requirements:
 - .1 Portland cement
 - .2 Blended hydraulic cement
 - .3 Supplementary cementing materials
 - .4 Admixtures
 - .5 Water
 - .6 Aggregates
 - .3 Mix designs for concrete, mix proportions and aggregate sources, which will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with CSA-A23.1/A23.2, and that mix design is adjusted to prevent alkali aggregate reactivity problems.
 - .4 Certification for the concrete supplier from the Atlantic Provinces Ready Mixed Concrete Association – APRMCA Concrete Production Facilities Certification Program.
- .3 Include in the submission of the mix designs, test results for each mix containing the following information:
 - .1 Plastic Concrete Tests
 - .2 Slump (CSA A23.2-5C)
 - .3 Air Content of Plastic Concrete by Pressure Method (CSA A23.2-4C)
 - .4 Mass Density and Yield (CSA A23.2-6C)
 - .5 Compressive Strength Testing (CSA A23.2-9C)
 - .6 2 cylinders to be tested at 28 days
 - .7 Air Void Analysis on Hardened Concrete (ASTM C457) tested at 7 days
 - .8 Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration (ASTM C1202) tested at 56 days
 - .9 Alkali Reactivity Test Results

- .4 Submit four (4) weeks in advance of concrete placement, relevant test data for all aggregate materials indicating conformance to the requirements of CSA-A23.1 and this specification. The test results required, but not be limited to, shall include:
 - .1 Sieve Analysis of Fine and Coarse aggregate
 - .2 Amount of Material Finer than 80 μm in Aggregate
 - .3 Bulk Relative Density and Absorption of Fine and Coarse Aggregate (SSD basis)
 - .4 Fineness Modulus of Fine Aggregate
 - .5 Clay Lumps and Light Weight Pieces
 - .6 Test for Organic Impurities in Fine Aggregate
 - .7 Flat and Elongated Particles in Coarse Aggregates
 - .8 Petrographic Analysis of Coarse Aggregate (PN-NSTIR Test Method-2)
 - .9 Resistance to Degradation of Coarse Aggregate by Abrasion and Impact in the Los Angeles machine
 - .10 Micro-Deval test for Coarse and Fine Aggregate
 - .11 Soundness of Coarse and Fine Aggregate by Use of Magnesium Sulphate
 - .12 Test for Detection of Alkali-Aggregate Reactivity (AAR) on Coarse and Fine Aggregate
 - .13 Unconfined Freeze and Thaw test
- .5 Submit two (2) weeks prior to commencement of the project adequate details of all equipment to be used. Equipment shall include that required for transporting, handling, placement and curing of all concrete.
- .6 Concrete pours: submit accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken as described in Part 3 – Field Quality Control.

1.5 QUALITY ASSURANCE

- .1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.
- .2 Submit to Departmental Representative, minimum of four weeks prior to starting concrete work, valid and recognized certificate from plant delivering concrete.
 - .1 When plant does not hold valid certification, provide test data and certification by qualified independent inspection and testing laboratory that materials used in concrete mixture will meet specified requirements.
- .3 Minimum four weeks prior to starting concrete work, submit proposed quality assurance procedures for review by the Departmental Representative on the following items:
 - .1 Falsework erection
 - .2 Hot weather concrete
 - .3 Cold weather concrete
 - .1 Departmental Representative can provide expected provisions for cold weather concreting prior to submitting a procedure.
 - .4 Placement method(s)
 - .5 Curing

- .6 Finishes
- .7 Formwork Removal
- .4 Quality Control Plan: submit written report to Departmental Representative verifying compliance that concrete in place meets performance requirements of concrete as established in Part 2 – Products.
- .5 Health and Safety Requirements: undertake occupational health and safety in accordance with Section 01 35 29.06 – Health and Safety Requirements.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Concrete hauling time: maximum allowable time for concrete to be delivered to site of Work and discharged not to exceed 120 minutes after batching.
 - .1 Modifications to maximum time limit must be agreed to by Departmental Representative and concrete producer as described in CSA A23.1/A23.2.
 - .2 Deviations to be submitted for review by Departmental Representative.
- .2 The concrete materials shall be mixed and transported in a manner which will not segregate or damage the mix in any fashion. Concrete shall be mixed using stationary or truck mixers. The mixer shall carry the Manufacturer's rating plate in a prominent position that indicates the following:
 - .1 The gross volume of the mixer
 - .2 The rated maximum mixing capacity
 - .3 The minimum and maximum speeds for mixing and agitating of the mixer
- .3 The mixer shall be capable of combining the concrete ingredients into a thoroughly mixed and uniform mass and shall not exceed the capabilities of the mixer.
- .4 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.
- .5 Where ready mix trucks are used to transport the concrete, the Departmental Representative reserves the right to subject any truck suspected of poor mixing to a uniformity test as outlined in CSA A23. If the truck fails the test, then the concrete and the truck shall be rejected at the sole cost of the Contractor unless otherwise directed by the Departmental Representative.
- .6 Waste Management and Disposal:
 - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
 - .2 Use trigger operated spray nozzles for water hoses.
 - .3 Carefully coordinate the specified concrete work with weather conditions.
 - .4 Divert unused concrete materials from landfill to local facility approved by Departmental Representative.
 - .5 Refer to Section 01 35 44 for requirements associated with the cleaning of concrete trucks and tools.
 - .6 Prevent admixtures and additive materials from entering drinking water supplies or streams. Using appropriate safety precautions collect liquid or solidify liquid

with inert, non-combustible material and remove for disposal. Dispose of waste in accordance with applicable local, provincial and national regulations.

- .7 Choose least harmful, appropriate cleaning method which will perform adequately.

1.7 MEASUREMENT FOR PAYMENT

- .1 Refer to Section 01 10 10 General Instructions for measurement for payment.
- .2 Costs associated with cold and/or hot weather concreting shall be considered incidental to the work.

Part 2 Products

2.1 MATERIALS

- .1 All cementing materials to CSA A3001.
- .2 Portland Cement: to CSA A5, normal type 10.
- .3 Water: to CSA A23.1 and to be free from injurious amounts of oil, acid, alkali soluble chloride, organic matter, sedimentation and other deleterious substances.
- .4 Aggregates: to CSA A23.1/A23.2 for Class C-1 exposure, with a minimum 28 day compressive strength of 35 MPa.
- .5 Coarse aggregates shall consist of washed crushed stone having a nominal size of 20 mm.
- .6 Fine aggregate shall be washed and classified for conform to the gradation limits specified in CSA A23.1.
- .7 The use of Alkali-Silica Reactive Aggregates shall not be permitted.
- .8 Curing compound: to ASTM C309, Type 2.
- .9 Joint sealer: self-leveling, two component sealant capable of remaining resilient over temperatures ranging from - 25° C to 35° C. Material will be capable of an elongation of 300%, have tensile recovery of 90% ASTM D412-75 (or latest edition), hardness of 25-35 Shore A and have a high bond strength to the concrete faces.
- .10 Silane Sealer: self-penetrating, 100% silane, clear, breathable. MasterProtect H 1000 (formerly Hydrozo 100) or approved equal.
- .11 Silicone Sealant: Dow Corning 888 Silicone Joint Sealant or approved alternate. The color shall be gray.
- .12 Dowel Baskets: Epoxy coated Dayton Superior Welded Dowel Bar Basket with bond breaker, or approved alternate.

2.2 MIXES

- .1 Prior to starting concrete work, submit to the Departmental Representative the proposed mix design(s) for approval. Mix design(s) to be in accordance with Alternative 1 of Table 5 in CSA A23.1-14 (or latest edition). Comply with additional requirements of CSA A23.1-14 (or latest edition), Section 15 for concrete placed near sea water.

- .2 Use concrete mix designed to produce air entrained concrete meeting the requirements for a Class C-1 exposure, with a minimum 28-day compressive strength of 35 MPa, maximum water to cement ratio of 0.4 and air entrainment of 5-8%.
- .3 Do not use calcium chloride or compounds containing calcium chloride.
- .4 Weigh aggregates, cement, water, and admixtures separately when batching. Inspect and test scales for accuracy as directed. Accuracy to be such that successive quantities can be measured to within one percent of desired amounts. Test certificates to be submitted to Departmental Representative upon request.
- .5 Where seven-day strength is less than 70% of specified 28-day strength; provide additional protection curing and make changes to mix proportions to the satisfactions of the Departmental Representative.
- .6 Provide certification that plant, equipment, and all materials to be used in concrete comply with the requirements of CSA A23.1-14 (or latest edition).
- .7 Provide certification from independent testing and inspection company that mix proportions selected will produce concrete of specified quality and can be effectively placed and finished for all work under this contract.
- .8 Tremie concrete shall meet the requirements of Nova Scotia Transportation & Infrastructure Renewal's (NSTIR) standard specification outlined in Table 5.7.1. The maximum aggregate size shall be 10 mm. The 28-day compressive strength shall be 35 MPa.

2.3 FINISHES

- .1 Provide a uniform broom finish on the top surface of the concrete deck.
- .2 Provide a uniform broom finish on the top surface of the new copewall.
- .3 Provide a smooth formed finish on the face of the new copewall.

Part 3 Execution

3.1 PREPARATION

- .1 Obtain Departmental Representative's written approval before placing concrete. Provide 24 hours minimum notice prior to placing concrete.
- .2 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.
- .3 During concreting operations for the concrete copewall:
 - .1 Vertical construction joints shall be provided every 6 meters.
 - .1 Concrete shall be placed in a checkerboard fashion.
 - .2 A minimum cure time of 48 hours shall be provided before the next adjacent section of copewall can be poured.
 - .2 At all vertical construction joints, the horizontal reinforcing steel shall not extend through the construction joint.
 - .1 A minimum of 75mm cover shall be provided to all reinforcing steel at this joint.

- .3 Horizontal construction joints will not be accepted (i.e. wall must be poured full height in one continuous pour).
- .4 No control joints shall be saw cut into the copewall.
- .5 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.
- .4 During concreting operations for the concrete deck:
 - .1 Construction joints shall be provided as outlined on the design drawings.
 - .1 Prefabricated dowel baskets shall be used at each construction joint.
 - .2 Control joints shall be saw cut as shown on the construction drawings.
 - .1 Concrete shall be saw cut as soon as possible after finishing without causing excessive raveling and before shrinkage cracks occur.
 - .3 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.
 - .5 Pumping of concrete is permitted only after review of equipment and mix by Departmental Representative.
 - .6 Ensure reinforcement and inserts are not disturbed during concrete placement.
 - .7 Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing.
 - .8 Protect previous Work from staining.
 - .9 Clean and remove stains prior to application of concrete finishes.
 - .10 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.
 - .11 Remove all debris including sawdust, chips and any other deleterious materials from the interior of the forms.
 - .12 Do not place load upon new concrete until authorized by Departmental Representative.

3.2 CONSTRUCTION

- .1 Perform cast-in-place concrete work to CSA A23.1/A23.2.
- .2 Concrete shall not be placed when the air temperature exceeds 25°C or is likely predicted to rise above this temperature during placement. The temperature of the formwork, reinforcing steel or other material on which the concrete is placed shall not exceed 25°C.
- .3 When the air temperature is forecasted to fall below 5 °C within 24 h of concrete placement, cold weather concrete practices shall be implemented.
- .4 Sleeves and inserts:
 - .1 Do not permit penetrations, sleeves, ducts, pipes, or other openings to pass through structural members, except where indicated or approved by Departmental Representative.
 - .2 Where approved by Departmental Representative, set sleeves, ties, pipe hangers and other inserts and openings as indicated or specified elsewhere.
 - .3 Sleeves and openings greater than 100 x 100 mm not indicated must be reviewed by Departmental Representative.

- .4 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain written approval of modifications from Departmental Representative before placing of concrete.
 - .5 Check locations and sizes of sleeves and openings shown on drawings.
 - .6 Set special inserts for strength testing as indicated and as required by non-destructive method of testing concrete.
- .5 Anchor bolts:
- .1 Set anchor bolts to templates under supervision of appropriate trade prior to placing concrete.
 - .2 When setting anchor bolts, care shall be taken to not only ensure that the anchor bolts are set in the correct position and orientation, but also that sufficient thread extension is provided to facilitate bolting the assembly to the concrete, complete with compatible nuts and washers (plate washers where specified), as per the detailed on the Contract Drawings.
- .6 Placing of concrete:
- .1 Placement of concrete below water shall be completed using the tremie method.
 - .1 Poor quality concrete which typically resides on top of a tremie pour shall be removed before the concrete has hardened.
 - .2 The Contractor is responsible for the placing method used for concrete placed above water.
 - .3 Concrete shall be delivered to the point of final deposit in a manner satisfactory to the Departmental Representative using means and equipment which will prevent segregation or loss of materials.
 - .4 The size of section to be placed in one continuous operation shall be as detailed on the drawings or as directed by the Departmental Representative.
 - .5 Unless otherwise authorized by the Departmental Representative, forms shall be kept dry during the placing of the concrete until the concrete has reached initial set.
 - .6 Concrete shall be deposited in the forms in maximum lifts of 500 mm and in layers that are approximately horizontal and as close as practicable to its final position.
 - .7 Concrete shall not be moved horizontally with vibrators or by other methods which could cause segregation.
 - .8 Under adverse weather conditions the Contractor shall be prepared to provide suitable protection in order to prevent damage to concrete.
 - .9 Consolidation:
 - .1 All methods of consolidation shall be subject to the approval of the Departmental Representative.
 - .2 Concrete shall be consolidated thoroughly and uniformly by means of hand tamping, vibrators or finishing machines to obtain a dense, homogeneous structure, free from cold joints, voids and honeycomb.
 - .3 A sufficient number of vibrators shall be employed to adequately handle the anticipated rate of placement. The size and frequency of vibrators

shall be as specified in CSA A23.1. A stand-by vibrator shall be available on the site at all times.

- .4 Internal vibrators shall be used wherever practicable. External type vibrators may be used where surfaces cannot be properly consolidated with the internal type alone.
 - .5 Insertion of internal vibrators shall be made systematically at intervals such that the zones of influence of the vibrator overlap.
 - .6 Extreme care shall be taken to ensure that the internal type vibrators do not displace the reinforcing steel or the forms. Vibrators shall have rubber or non-metallic vibrating heads.
- .10 Curing concrete:
- .1 Concrete shall be protected from freezing, premature drying, high temperature and moisture loss for a period necessary to develop the desired properties of the concrete.
 - .2 Curing shall be applied to concrete as soon as possible without damaging or marring the surface.
 - .3 Curing compounds shall conform to ASTM C309 Type 2.
 - .4 All fresh placed and consolidated concrete shall be suitably protected from the elements and from defacement due to construction activities, traffic, and vandals. The effects of direct sunshine, drying winds, cold, excessive heat and running water are particularly harmful. The concrete shall be protected using adequate tarpaulins or other suitable material to completely cover, or enclose, all freshly finished surfaces.
 - .5 The curing time and methods shall be as indicated in CSA A23.1.
 - .6 Wet cure the slab on grade for a minimum of 7 days after placement or apply an approved water-based curing compound suitable for the site conditions immediately after completion of slab finishing.
 - .7 Hot Weather Concreting (if approved by Departmental Representative):
 - .1 When the air temperature is at or above 25°C or is likely to rise above 25°C within 24 hours, special measures, as detailed in CSA A23.1 shall be taken by the Contractor to protect the concrete from the effects of hot and /or drying weather conditions.
 - .2 The temperature of the formwork, reinforcing steel or the material on which the concrete is to be placed, shall not exceed 25°C. Concrete temperatures shall not exceed those specified in CSA A23.1, Table 16.
- .11 Cold Weather Concreting:
- .1 When the mean air temperature is at or below 5°C or when the temperature is likely to fall below 5°C within 48 hours of concrete placement, the Contractor shall place, cure and protect concrete in accordance with CSA 23.1 and this specification.
 - .2 Concrete shall not be placed on or against any surface which is at a temperature less than 5°C. Snow and ice shall be removed before concrete is deposited on any surface.

- .3 Calcium chloride or other de-icing chemicals shall not be used as a de-icing agent in the forms.
- .4 If heating of the mix water and/or aggregates is approved for use, the charging cycle shall be altered to prevent flash setting of the concrete.
- .5 Aggregates and water shall not be heated above 80°C. Water and/or aggregates heated to a temperature in excess of 40°C, prior to the addition of the cementing materials shall be approved by the Departmental Representative.
- .6 All frozen lumps of aggregate shall be excluded from the mix.
- .12 Protection Classes:
 - .1 Protection requirements depend upon the outside temperature, the wind velocity, and the size of the concrete section. Provide protection as outlined in CSA A23.1/A23.2, latest edition.
- .13 Tremie Concrete:
 - .1 Placement of all tremie concrete shall be done using the methods outlined in NSTIR's standard specification as per Clause 5.3.1 – Placing Concrete Under Water (Tremie Method).
- .7 Finishing of Concrete:
 - .1 Basic Treatment:
 - .1 Upon removal of the forms, all cavities, honeycomb, and other deficiencies shall be patched with sand cement mortar of the same composition as that used in the concrete.
 - .2 Mortar shall be composed of cement, fine aggregate and water, proportioned and mixed as specified.
 - .3 When the proportioning of cement and fine aggregate is not specified, the mortar shall consist of one (1) part by volume of cement and two (2) parts of fine aggregate.
 - .4 The quantity of water used in mixing the mortar shall be sufficient to make it capable of being freely spread with the trowel.
 - .5 Mortar shall be mixed in quantities which can be utilized within 60 minutes.
 - .6 Mortar shall not be re-tempered or re-mixed with water after initial set.
 - .7 All bolts, ties, nails, or other metal not specifically required for construction purposes, shall be removed or cut back to a depth of 70 mm from the surface of the concrete unless otherwise directed by the Departmental Representative.
 - .8 The cavity shall be kept saturated for 60 minutes prior to the application of latex bonding agent or neat cement paste.
 - .9 The mortar shall be pressed or packed into the depressions so as to completely fill the cavity and then finished to match the adjacent surface.
 - .10 Fins, unsightly ridges, or other imperfections shall be chipped or rubbed off flush with the surface.

- .11 Mortar patches in excess of 25 mm shall be applied in layers not exceeding 25 mm with a 30-minute interval between the placing of layers.
 - .12 The surface of the patch shall be textured equivalent to the adjacent concrete.
 - .13 Honeycomb areas or cavities over 25 mm in diameter shall not be repaired until inspected by the Departmental Representative.
 - .14 Where honeycombing has occurred in non-structural elements, the affected area shall be removed and filled with mortar as previously described.
 - .15 Where honeycombing has occurred in structural elements, the corrective method of treatment shall be carried out as directed by the Departmental Representative.
 - .16 All concrete and mortar shall be cured and protected in accordance with CSA A23.1.
- .8 Concrete tolerance in accordance with CSA-A23.1/A23.2.

3.3 CRACKS

- .1 Repair all cracks greater than 0.2mm in width with an epoxy injection grout. Repair methods and materials to be submitted to a Departmental Representative for approval.

3.4 FIELD QUALITY CONTROL

- .1 Site tests: conduct tests as follows in accordance with Section 01 45 00 - Quality Control and Section 1.6, Quality Assurance, of this Section and submit report as described in Part 1 - Submittals.
 - .1 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by Departmental Representative for review to CSA A23.1/A23.2.
 - .2 Carry out tests for slump, air content, compressive strength and temperature in conformance with CAN/CSA A23.1 and CAN/CSA A23.2
 - .3 Frequency of testing as follows:
 - .1 Air, Slump and Temperature: one test for each load of concrete until satisfactory control is established daily and rate of placement > 35 m³ per hour; then one (1) test for each three (3) loads of concrete. Satisfactory control is considered to have been established when tests on five consecutive loads or batches of concrete are within specification requirements.
 - .2 Concrete shall be tested for slump, air content and temperature prior to and after the addition of superplasticizer (if added on site). Testing shall be carried out at the point of discharge from the truck and as close as possible to the final deposit into the forms. Sufficient superplasticizer shall be added to produce the desired consistency and if added on site, the superplasticizer shall be mixed into the load a minimum of five minutes prior to retesting.

- .3 A set of three regular compressive strength cylinders shall be made for every pour. If pours exceed 50 m³, cylinders shall be provided for every 50 m³ or fraction thereof.
 - .1 Additional cylinders shall be cast as directed by the Departmental Representative.
 - .2 In addition, for every regular set of three cylinders, two additional cylinders will be cast to be tested only if requested by the Departmental Representative for appeal purposes.
- .4 The responsibility for casting any additional cylinders required for interim testing lies with the Contractor.
- .5 Ensure there is no accelerated curing of concrete cylinders
- .2 The Departmental Representative shall have the right to sample and test all materials used in the mixture design and given access to the production facilities of the ready-mix supplier. Materials failing to meet requirements to be immediately rejected.
- .3 Ensure test results are distributed to all parties.
- .4 Departmental Representative will pay for costs of tests as specified in Section 01 29 83 - Payment Procedures for Testing Laboratory Services.
- .5 Departmental Representative may take additional test cylinders as required. Cure cylinders on job site under same conditions as concrete which they represent.
- .6 Non-Destructive Methods for Testing Concrete: to CSA A23.1/A23.2.
- .7 Inspection or testing by Departmental Representative will not relieve Contractor of their contractual responsibility.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

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

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A53/A53M-07, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A307-07b, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.181-92, Ready-Mixed, Organic Zinc-Rich Coating.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA G164-M92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CSA-S16-14, Design of Steel Structures.
 - .4 CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding.
 - .5 CSA W47.1-09, Certification of Companies for Fusion Welding of Steel.
 - .6 CSA W59-13, Welded Steel Construction (Metal Arc Welding).
 - .7 CSA S6-14, CSA S6 Canadian Highway Bridge Design Code (CHBDC)

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature specifications and data sheet in accordance with Section 01 33 00 – Submittal Procedures.
- .3 Shop Drawings:
 - .1 Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures.
 - .2 Submit drawings stamped and signed by Professional Engineer registered or licensed in the Province the work is being completed.
 - .3 Indicate materials, all necessary geometric details, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

1.4 QUALITY ASSURANCE

- .1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certifications: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Pre-installation Meetings: Conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Packing, Shipping, Handling and Unloading:
 - .1 Deliver, store, handle and protect materials from damage.
- .2 Storage and Handling Requirements:
 - .1 Store materials off ground and in accordance with manufacturer's recommendations.
 - .2 Replace defective or damaged materials with new.
- .3 Packaging Waste Management: as much as possible, remove for reuse by manufacturer any pallets, crates, padding and packaging materials.

1.6 WASTE MANAGEMENT DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

1.7 MEASUREMENT FOR PAYMENT

- .1 Refer to Section 01 10 10 General Instructions for measurement for payment.

Part 2 Products

2.1 MATERIALS

- .1 Steel plates, channels, angles and round bar: to CSA G40.20/G40.21, Grade 350W.
- .2 HSS: to ASTM A500, Grade C.
- .3 Tie-Rods: Tie rods shall meet the requirements of ASTM A615.
 - .1 The minimum yield stress shall be 517 MPa/75 ksi.
 - .2 The tie rods shall be continuously threaded bar.
 - .3 The nut shall be capable of developing the full yield capacity of the bar.
 - .4 Welding of tie rods is not acceptable unless approved by a Departmental Representative.
- .4 Embedded Concrete Anchor Bolts: to ASTM F1554, Grade 55.
 - .1 The minimum yield stress shall be 379 MPa/55 ksi.

- .5 Waler Bolts: to ASTM F1554, Grade 36 (248 MPa).
 - .1 The minimum yield stress shall be 248 MPa/36 ksi.
- .6 Threaded Bar: to ASTM F1554, Grade 36 (248 MPa).
 - .1 The minimum yield stress shall be 248 MPa/36 ksi.
- .7 Steel Shear Stud Connectors: Acceptable studs are produced by Nelson Stud Welding, Continental Studwelding Limited or approved equal.
 - .1 Shear stud connectors shall meet the requirements of ASTM A108 Grades G10100 to G10200.
 - .2 Shear stud connectors shall meet the requirements of CSA W59, Annex H.
 - .1 Only studs of Type B shall be used as defined by CSA W59, Annex H.
- .8 All epoxy adhesive shall be Hilti Hy-200, O.A.E.

2.2 FABRICATION

- .1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .2 Where possible, fit and shop assemble work, ready for erection.
- .3 Welding: in accordance with CSA W59, latest edition.
- .4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

2.3 FINISHES

- .1 All structural steel products shall be hot dip galvanizing: to ASTM A123/A123M, Coating Grade 85 (minimum zinc coating of 600 g/m²).
- .2 All structural steel hardware shall be hot dip galvanizing: to ASTM A153/A153M.
 - .1 Pieces shall be galvanized based on the appropriate class of material as outlined in this specification.
- .3 The following items shall not be galvanized (i.e. black steel):
 - .1 New steel plate required to repair the existing steel sheet pile wall.
 - .2 New tie rods.
 - .3 New waler bolts.

Part 3 Execution

3.1 ERECTION

- .1 Supply components for work by other trades in accordance with shop drawings and schedule.
- .2 Touch-up damaged galvanized surfaces with zinc rich primer.
- .3 Install items as per Contract Drawings / Approved Shop Drawings.

- .4 All epoxy grouted embedded anchors shall be installed with an epoxy adhesive which can develop the full strength of the bar. All anchors shall be installed as per the manufacturer's specification.
- .5 When installing the new tie rods, the tie rods shall be installed such that the rod is straight and has no sag.
 - .1 This shall be inspected and approved prior to backfilling.

3.2 CLEANING

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt. All cleaning shall meet the approval of Departmental Representative.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.3 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by metal fabrications installation.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 35 44 - Environmental Procedures.
- .3 Section 01 50 00 - Temporary Facilities.
- .4 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .5 Section 02 41 13 – Selective Site Demolition.
- .6 Section 31 32 19.01 – Geotextiles.

1.2 MEASUREMENT PROCEDURES

- .1 Excavated materials will be measured in accordance with Section 01 10 10.
- .2 Shoring, bracing, cofferdams, underpinning, and de-watering of excavation, as required, will not be measured separately for payment.
- .3 Backfilling to authorized excavation limits will be measured in accordance with Section 01 10 10.
- .4 Placing and spreading of gravel will be measured for payment in accordance with Section 01 10 10.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM C 117-Latest Edition, Standard Test Method for Material Finer Than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C 136-Latest Edition, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D 422-Latest Edition, Standard Test Method for Particle-Size Analysis of Soils.
 - .4 ASTM D 698-Latest Edition, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³) (600 kN-m/m³).
 - .5 ASTM D 1557-Latest Edition, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³) (2,700 kN-m/m³).
 - .6 ASTM D 4318-Latest Edition, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-Latest Edition, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-Latest Edition, Sieves, Testing, Woven Wire, Metric.
- .3 Canadian Standards Association (CSA)
 - .1 CAN/CSA-A3000-A5-98, Portland Cement.

- .2 CAN/CSA-A23.1-00, Concrete Materials and Methods of Concrete Construction.

1.4 SUBMITTALS

- .1 Samples:
 - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Inform a Departmental Representative at least 4 weeks prior to commencing Work, of proposed source of fill materials and provide access for sampling.
 - .3 Upon Request, submit 70 kg samples of type of fill specified including representative samples of excavated material.
 - .4 Upon request, ship samples prepaid to an address specified by the Departmental Representative in tightly closed containers to prevent contamination.

Part 2 Products

2.1 MATERIALS

- .1 See Section 31 37 00 for material specifications.

2.2 GEOTEXTILES

- .1 See Section 31 32 19.01 for geotextile specifications.

Part 3 Execution

3.1 SITE PREPARATION

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

3.2 STOCKPILING

- .1 Stockpile fill materials in the laydown area. Stockpile granular materials in a manner to prevent segregation.
- .2 Protect fill materials from contamination.

3.3 EXCAVATION

- .1 Advise a Departmental Representative at least 7 days in advance of excavation operations.
- .2 Excavate to lines, grades, elevations, and dimensions as directed by a Departmental Representative.
- .3 Remove concrete and other obstructions encountered during excavation in accordance with Section 02 41 13 - Selective Site Demolition.
- .4 Excavation must not interfere with bearing capacity of adjacent foundations.
- .5 Dispose of surplus and unsuitable excavated material in approved location.
- .6 Do not obstruct flow of surface drainage or natural watercourses.

- .7 Install geotextiles in accordance with Section 31 32 19.01-Geotextiles.

3.4 FILL TYPES AND COMPACTION

- .1 All fill materials will be in accordance with Section 31 37 00 – Fills. Compaction densities are percentages of maximum densities obtained from ASTM D 698. See Section 31 37 00 for compaction requirements for different fills.

3.5 BACKFILLING

- .1 Do not proceed with backfilling operations until a Departmental Representative has inspected and approved installations.
- .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .3 Do not use backfill material which is frozen or contains ice, snow or debris.
- .4 Place backfill material in uniform layers not exceeding 300 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
- .5 Backfilling around installations.
 - .1 Place bedding and surround material as specified elsewhere.
 - .2 Do not backfill around or over cast-in-place concrete within 48 hours after placing of concrete.
 - .3 Place layers simultaneously on both sides of installed Work to equalize loading. Difference not to exceed 0.25 m.
 - .4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:
 - .1 Permit concrete to cure for minimum 14 days or until it has sufficient strength to withstand earth and compaction pressure and approval obtained from a Departmental Representative.
- .6 Install geotextiles in backfill in accordance with section 31 32 19.01 – Geotextiles as directed by a Departmental Representative.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Materials and installation of polymeric geotextiles purpose of which is to:
 - .1 Separate and prevent mixing of granular materials of different grading.

1.2 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.

1.3 MEASUREMENT PROCEDURES

- .1 Refer Sections 01 10 10 for measurements for payment.

1.4 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM D4632. Grab Tensile strength test.
 - .2 ASTM D 4751, Standard Test Method for Determining Apparent Opening Size of a Geotextile.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-4.2 No. 11.2-M89(April 1997), Textile Test Methods - Bursting Strength - Ball Burst Test (Extension of September 1989).
 - .2 CAN/CGSB-148.1, Methods of Testing Geotextiles and Complete Geomembranes.
 - .1 No.7.3-92, Methods of Testing Geotextiles and Geomembranes - Grab Tensile Test for Geotextiles.

1.5 SUBMITTALS

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to a Departmental Representative the following samples at least 4 weeks prior to beginning Work.
 - .1 Minimum length of 2 m of roll width of geotextile.
 - .2 Minimum of 1 m seam with at least 300 mm of geotextile on both sides of seam.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 During delivery and storage, protect geotextiles from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris, and rodents.

1.7 MEASUREMENT FOR PAYMENT

- .1 Refer to Section 01 10 10 General Instructions for measurement for payment.

Part 2 Products

2.1 MATERIAL

- .1 Geotextile: Non-Woven synthetic fiber fabric, supplied in rolls.
 - .1 Width: 3.5 m minimum.
 - .2 Length: 150 m minimum.
- .2 Synthetic non-woven geotextile (also referred to as filter fabric) to be used on the side slopes of the containment cell and for the floating silt curtain.
- .3 Physical properties:
 - .1 Mass per unit area: to CAN/CGSB-148.1, No.2, minimum 540 g/m².
 - .2 Grab tensile strength 1690 N.
 - .3 Tear Resistance: 644 N.
 - .4 Puncture CRB: 4820 N.
- .4 Hydraulic properties:
 - .1 Apparent opening size (AOS): to ASTM D 4751, 0.15 mm.
 - .2 Permittivity: to ASTM D 4491, 0.7 pers.
- .5 Securing pins and washers: to CAN/CSA-G40.21, Grade 300W, hot-dipped galvanized with minimum zinc coating of 600 g/m² to CAN/CSA G164.

Part 3 Execution

3.1 INSTALLATION

- .1 Place geotextile material by unrolling onto graded surface in orientation, manner and locations indicated and retain in position with pins or weights.
- .2 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.
- .3 Place geotextile material on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.
- .4 Cut geotextile around driven piles such that the material lays flat on the excavated surface.
- .5 Overlap each successive strip of geotextile approximately 600 mm over previously laid strip.
- .6 Pin successive strips of geotextile with securing pins at 600 mm interval at mid-point of lap.
- .7 Protect installed geotextile material from displacement, damage, or deterioration before, during and after placement of material layers.
- .8 After installation, cover with overlying layer within 4 hours of placement.
- .9 Replace damaged or deteriorated geotextile to approval of a Departmental Representative.

- .10 Place and compact soil layers in accordance with Section 31 23 33.01 - Excavating Trenching and Backfilling.

3.2 PROTECTION

- .1 Vehicular traffic not permitted directly on geotextile.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Refer to Section 01 33 00 for submittal requirements.

1.2 REFERENCE STANDARDS

- .1 ASTM C127-88(2001) el (or latest edition) Specific Gravity and Absorption of Coarse Aggregate.
- .2 AASHTO T85-88 (or latest edition) Specific Gravity and Absorption of Coarse Aggregate.

1.3 SUBMISSIONS

- .1 Product Data/Samples:
 - .1 Provide samples of materials proposed for the work.
- .2 Methodology:
 - .1 Provide methodologies for carrying out the work
- .3 Provide submissions in accordance with Section 01 33 00.

1.4 MEASUREMENT FOR PAYMENT

- .1 All fills shall be measured in accordance with Section 01 10 10.
- .2 Prices will include the entire cost of supplying and placing the material in the work, rough grading as necessary, the leveling and finish grading of the listed materials, taking soundings, diving inspections, shoring, bracing, underpinning, all as shown on the drawings, and as specified.
- .3 Departmental Representative will only pay for incorporated fills used in the work.

Part 2 Products

2.1 MATERIALS

- .1 Type 1 Gravel:
 - .1 The gravels shall be free from flat, elongated or other objectionable pieces and shall be approved by the Engineer prior to utilization. The gravels shall be tested in accordance with ASTM C 117 and C 136 and shall fulfil the gradation requirements of the PEI Department of Transportation and Infrastructure Renewal - General Provisions and Contract Specifications for Highway Construction for Class A aggregates (see Section 401).
 - .2 The material shall be approved by a Departmental Representative prior to utilization.

- .2 Premium Borrow:
 - .1 Premium Borrow shall be non-plastic, well graded, and composed of clean, uncoated particles free from lumps of clay and other deleterious material with a maximum particle size of 100 mm, and a maximum of 20% of the material passing the 4.75 mm Sieve shall pass the 75 µm Sieve.
 - .2 Premium Borrow shall meet the requires of the PEI Department of Transportation and Infrastructure Renewal - General Provisions and Contract Specifications for Highway Construction.
 - .3 All Premium Borrow shall be placed and compacted as per the PEI Department of Transportation and Infrastructure Renewal - General Provisions and Contract Specifications for Highway Construction.

Part 3 Execution

3.1 PREPARATION

- .1 Prior to placing fills in the positions indicated on the drawings, ensure all construction debris is removed and Geotextile is installed as per Section 31 32 19.01.

3.2 PLACEMENT

- .1 Ensure the placement method for all Fills is reviewed and approved by a Departmental Representative before commencing the work.
- .2 Place the Premium Borrow inside the existing steel sheet pile wall structure up to the underside of the Type 1 Gravel layer.
- .3 Type 1 gravels shall be placed and compacted to a minimum of 95% of the ASTM D1557 (modified Proctor) maximum dry density.
- .4 Premium Borrow shall be placed and compacted to a minimum of 95% of the Standard Proctor density.
- .5 Prior to placing new Premium Borrow behind the East side of the structure, install geotextile and ensure it wraps up the side of the steel sheet piling 610mm.

3.3 TOLERANCES

- .1 Surface of bearing layer to be within 50 mm of elevation indicated and variation in elevation over whole area of bearing layer not to exceed 75mm.
- .2 Other layers to be within 100 mm of lines shown.

3.4 PROTECTION

- .1 Consider 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.
- .4 The Contractor will be responsible to replace any materials lost due to storms, tidal erosion or by their own activities.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 35 44 – Environmental Procedures

1.2 PRICE AND PAYMENT PROCEDURES

- .1 See Section 01 10 10 – General Instructions for measurement payment procedures.
- .2 There will be no additional payment for delays caused by fishing seasons.
- .3 There will be no additional payment for delays caused by vessel traffic.
- .4 There will be no additional payment for down time.
- .5 There will be no additional payment for subsequent infilling after designated areas have been excavated and cleared.
- .6 Removal of material infilling during excavating will be incidental to work.
- .7 There will be no additional payment for side slopes as they are considered incidental to this contract.
- .8 There will be no additional payment for delays or changes in excavating methods required as a result of water quality monitoring results.

1.3 REFERENCES

- .1 Definitions:
 - .1 Excavating: excavating, transporting, and disposing of underwater materials as specified.
 - .2 Class "A" Material: boulders containing 3.0 cubic metres or more, and solid rock requiring drilling and blasting or hydraulic splitting to loosen.
 - .3 Obstruction: material other than Class "A", having individual volumes of 3.0 cubic metres or more.
 - .4 Class "B" Material: loose or shale rock, sand, quick sand, mud, shingle, clay and sand, gumbo, hardpan, clay, marine clay, clay sizes, marine silt, silt and gravel, gravel, cobbles, boulders, marine shells, or any other materials not defined under Class "A" material.
 - .5 Debris: pieces of wood, wood chips, bark, logs, submerged logs, tree branches, scrap vehicle tires, concrete, steel cable, steel chain, wire rope, scrap steel, etc.
 - .6 Square Metres: area is square metres projected horizontal.
 - .7 Grade: plane or planes above which all material is to be excavated.
 - .8 Estimated Quantity: volume in cubic metres of material calculated from neat plan view dimensions as indicated.
 - .9 U.T.M. Coordinates: Universal Transverse Mercator plan rectangular grid system to be used for all horizontal control of excavating operations as indicated on plan. (NAD 83)

- .10 Matrix Block: each block area is presented as a number of 1.2 X 3.0 m long blocks. Dependent on the position of the sounding a block may have 1 to 4 soundings contained within it. A blank Matrix Block will indicate that no sounding was registered for that matrix.
- .11 Minimum Mode: a mode of operation of hydrographic survey equipment where the minimum sounding over the length of travel between position updates will be retained in memory.
- .12 Least of Minimum Plan: a hydrographic survey plan in which the least sounding in that matrix block is plotted.
- .13 Instantaneous Mode: a mode of operation of hydrographic survey equipment where only the sounding observed at a predetermined distance interval is retained in memory.
- .14 Average of Instantaneous Plan: a hydrographic survey plan in which the average of instantaneous soundings in that matrix block is plotted.
- .15 Side Slope: inclined surface or plane from grade at side limit of excavation area to intersect original ground line outside of side limit and to be expressed as a ratio of horizontal to vertical. All material above side slopes is to be excavated.
- .16 Cleared Area: a excavated area that has been accepted by the Departmental Representative as complying with plans and specifications and all material removed to grade.
- .17 Box Cut: excavating and letting the side of the excavation collapse, where possible, to an equilibrium slope.
- .18 Chart Datum: by international agreement, a plane below which the tide will seldom fall. The Canadian Hydrographic Services has adopted the plane of Lowest Norman Tide (LNT) as Chart Datum. As the rise, fall and ranges of tides varies daily, The Canadian Hydrographic Services should be consulted for tidal prediction and other tidal information relating to the work.
- .19 CEAA: Canadian Environmental Assessment Act.

1.4 LOCATION

- .1 Contract drawings indicate those areas which require excavation at the time of the most recent surveys. Actual extent of excavation removals within the areas may vary slightly from those indicated on the drawings.

1.5 SCHEDULING

- .1 Submit to Departmental Representative, within 10 working days after award of Contract, a schedule of work including time periods during which each operation involved in the work will be undertaken.
- .2 Include in the above schedule of work a list of buoys which interfere with the progress of this work. Coordinate with the Departmental Representative arrangements to be made to relocate these buoys to avoid unnecessary delay.
- .3 Adhere to the schedule and take immediate action to correct any slippage by effectively altering operations or mobilizing other equipment. The Departmental Representative is to be notified of the corrective action to be taken.

1.6 INTERFERENCE TO NAVIGATION

- .1 Be familiar with activities on site and vessel movements in areas affected by work.
- .2 Plan and execute work in a manner that will not impede navigation including movement of vessels in the channel.
- .3 Plan and execute work in a manner that will not interfere with activities at wharf sites, or access to wharves by land or water.
- .4 The Departmental Representative or owner will not be responsible for loss of time, equipment, material, or any other charges related to interference with vessels in the harbour, weather conditions, or due to other Contractor's operations.
- .5 Be responsible for damage to buoys or other navigation markers caused by work. If such occurs, notify Canadian Coast Guard. Assume responsibility for replacement or repairs.

1.7 INTERFACE TO FISHERY OPERATIONS AND DAMAGE TO FISHING GEAR

- .1 Become familiar with fishery activities. Clearly mark excavation area, disposal areas and routes to and from excavation site and disposal areas during periods when fishing gear is set in areas adjacent to operations with "Cautionary Buoys" in accordance with Coast Guard Standard TP968 (<http://www.ccg-gcc.gc.ca/aids/home>). All buoys must be coloured cautionary yellow - CGSB # 505-108 and be equipped with radar reflectors.
- .2 Be responsible for all costs associated with the supply, installation, and removal of all necessary temporary aids. The Contractor will receive approval from the District Fisheries Officer for the location of the buoys, upon review and acceptance of temporary aids by the Departmental Representative.
- .3 Keep District Manager, Canadian Coast Guard, Transport Canada, informed of buoyed corridors in order that necessary Notices to Shipping can be issued.
- .4 Execute the work to ensure damage does not occur to fishing gear and interference to fishing operations is minimized by conducting operations within the areas so marked.
- .5 Be responsible for damage to fishing gear outside marked areas, if as a result of construction activities, and if damage occurs, assume responsibility for replacement or repair costs and cost of lost fishing opportunity.

1.8 REQUIREMENTS OF REGULATORY AGENCIES

- .1 Perform work in accordance with the National Building Code of Canada (NBC) and any other municipal, provincial and/or national codes relating to the project. 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.
- .3 Mark floating equipment with lights in accordance with Regulations for the Prevention of Collisions, as required by Transport Canada.
- .4 Contractor will be required to obtain prior approval from applicable regulatory agencies for any excavation outside specified limits.

1.9 DATUMS

- .1 Horizontal Datum: All horizontal coordinates used in this specification and contact drawings are in metres referenced to U.T.M. projection based on the North American

Datum, 1983, (NAD83, Zone 20). Survey control monuments and their coordinate values are shown on Plan.

- .2 Vertical Datum: All elevations and soundings used in this specification and contract drawings are in metres referenced to Chart Datum.

1.10 INSPECTION OF SITE

- .1 The Contractor should visit the site of the work before tendering to be familiar with the extent and nature of the work and all conditions affecting the work.

1.11 SITE INFORMATION

- .1 It is anticipated that the following materials will be encountered within the excavation limits, but are not limited to:
 - .1 Class "B" Materials
 - .2 Debris
- .2 The Contractor shall take the necessary steps to become fully familiar with potential inclement weather and sea conditions in this area.
- .3 The Contractor will be responsible for making his own interpretation of soil conditions.

1.12 EXCAVATION EQUIPMENT

- .1 On request, prove to the satisfaction of the Departmental Representative that the methodology and equipment proposed are adequate to finish the work to quality, and schedule specified. If Inadequate, replace or provide additional equipment as directed.
- .2 Contractor shall be responsible for ensuring that equipment can access and function at the site.

1.13 SURVEY REQUIREMENTS

- .1 The Contractor shall sound areas immediately after excavating to verify that grade depth has been attained. Areas are to be sounded with adequate coverage to provide a bathymetric printout of at least 5 metre spacing on a UTM grid to the approval of the Departmental Representative. A copy of the Contractor's positioning and sounding records shall be provided to the Departmental Representative.

1.14 SEQUENCE OF ACCEPTABLE WORK

- .1 Post-excavation survey will be undertaken by the Contractor upon completion of excavation work. Submit results as indicated in item 1.13 above. The survey will confirm if excavation is completed as specified.
- .2 The Contractor will re-excavate as necessary to remove all material within the excavation limits areas which is found to be above the average of instantaneous elevations as specified on post-excavation survey.
- .3 All surveys will be performed to Canadian Hydrographic Service Standards.

Part 2 Products

2.1 EQUIPMENT

- .1 Contractor to determine required equipment necessary to excavate material specified and to dispose of dredged material at location indicated on the Contract drawings.

Part 3 Execution

3.1 General

- .1 The Contractor shall do the following in executing the work:
 - .1 Place and maintain buoys, ranges, markers and lights required to define work.
 - .2 Maintain and lay out work form bench marks and control points as shown on Plan and noted in the Specifications. Any additional control points and tidal reference stations required to control operations are the responsibility of the Contractor. The Contractor is to maintain these control points and tidal reference stations for the duration of the project and at the Contractor's cost.
 - .3 Obtain owner's permission, in writing, to establish layout monuments and erect targets on private property and pay all associated rental costs. Provide access to layout monuments for departmental survey crews. Any damage to private property will be made good by the Contractor to the satisfaction of the Departmental Representative at no cost to the owner.
 - .4 Establish accurately and maintain water level gauges or tide boards in order that proper depth of excavation can be determined. Locate gauges so as to be clearly visible at all times.
 - .5 The Contractor is to provide a tidal monitoring system to read and record the tide level at a maximum of 15 minute intervals. These records are to be made available for the inspection and use of the Departmental Representative. If using an electronic tide gauge, the Contractor must check the accuracy of the gauge daily. The gauge must be accurate to ± 2 cm. The monitoring system is to be approved by the Departmental Representative.
 - .6 Excavate areas to grade depths below Chart Datum where indicated on the drawing.
 - .7 Excavate all side slopes to two horizontal to one vertical unless otherwise noted.
 - .8 Remove all materials above specified grade depth and side slopes, within limits indicated. Material removed from below grade depth or outside specified area or side slope is not part of work.
 - .9 Remove shoaling which occurs as a result of the work at no expense to Departmental Representative.
 - .10 Remove material cast-over onto surrounding area and dispose of it as at Contractor's expense. Casting over of material is not permissible unless authorized by the Departmental Representative.
 - .11 The Contractor is responsible for the removal of infilling in excavation areas which occurs prior to acceptance by the Departmental Representative.

- .12 Immediately notify the Departmental Representative upon encountering any object which might be classified as an obstruction. By-pass the object, after clearly marking its location by coordinates and continue work.
- .13 Refer to Section 01 35 44 for Water quality monitoring.

3.2 Encountering Class "A" Material

- .1 Identify areas where Class "A" material is encountered above specified grades, work equipment, which may require the use of toothed buckets, over areas to remove all Class "B" material, until Departmental Representative is satisfied that further removal cannot be accomplished without blasting. Immediately identify these areas with UTM coordinates and provide information to Departmental Representative.

3.3 Rock Removal

- .1 If rock or boulders are to be removed by blasting, submit to Departmental Representative for review, two weeks before removal, details of proposed blasting operations showing types and quantities of explosives, loading charges and patterns, type of caps, blasting techniques, blast protection measures, time of blasting and other pertinent details. Submit subsequent charges to Departmental Representative before proceeding.

3.4 Existing Navigation Buoys

- .1 The Contractor will make arrangements with Transport Canada for the removal and reinstallation of the existing buoys, as required to carry out the excavation operations.

3.5 Disposal of Excavated Materials

- .1 All excavated material, not to be reused, is to be placed in the existing containment cell.
- .2 Timber, logs and steel must not be disposed in the containment cell. This debris must be disposed of at an appropriate landfill. This debris and its disposal will not be measured for payment.

3.6 Cooperation and Assistance to Departmental Representative

- .1 Cooperate with Departmental Representative on inspection work and provide assistance requested.
- .2 On request of Departmental Representative, furnish use of equipment, labour and materials to inspect and monitor work.
- .3 Provide Departmental Representative or inspector with copies of, or access to, daily records of excavation activity, including areas excavated, type of material, hours and reasons for downtime, and other information regarding excavation and disposal as requested by the Departmental Representative.

END OF SECTION

APPENDIX 1 - COMBINED PRICE FORM

- 1) The prices per unit will govern in establishing the Total Extended Amount. Any arithmetical errors in this Appendix will be corrected by Canada.
- 2) Canada may reject the bid if any of the prices submitted do not reasonably reflect the cost of performing the part of the work to which that price applies.

LUMP SUM

The Lump Sum Amount designates Work to which a Lump Sum Arrangement applies.

- (a) Work included in the Lump Sum Amount represents all work not included in the unit price table.

TOTAL LUMP SUM AMOUNT (LSA) Excluding applicable tax(es)
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UNIT PRICE TABLE

The Unit Price Table designates Work to which a Unit Price Arrangement applies.

- (a) Work included in each item is as described in the referenced specification section.
- (b) The Price per Unit shall not include any amounts for Work that is not included in that unit price Item.

Item No.	Specification Reference	Class of Labour, Plant or Material	Unit of Measurement	Estimated Quantity (EQ)	Price per Unit applicable taxes extra (PU)	Extended amount (EQ x PU) applicable
1	Division 03	Cast-in-Place Concrete Deck	m ³	105		
2	Division 03	Cast-in-Place Concrete Copewall	m ³	145		
3	Division 05	Structural Steel Repairs	m ²	8		
4	Division 05	Tie Rods	Each	21		
5	Division 05	Waler Bolts	Each	6.6		
6	Division 05	Ladders	Each	4		
7	Division 05	Vertical Holdfasts	Each	4		
8	Division 05	Wheel Guard	m	111		
9	Division 31	Premium Borrow	mT	1350		
10	Division 31	Type 1 Gravel	t	290		
11	Division 35	Underwater Excavation	m ³	200		
TOTAL EXTENDED AMOUNT (TEA) Excluding applicable tax(es)						
TOTAL BID AMOUNT (LSA + TEA) Excluding applicable tax(es)						

Solicitation No. - N° de l'invitation

Amd. No. - N° de la modif.

Buyer ID - Id de l'acheteur

Client Ref. No. - N° de réf. du client

File No. - N° du dossier

CCC No./N° CCC - FMS No./N° VME
