Fisheries and Oceans
Canada

Small Craft Harbours

Ste-Thérèse-de-Gaspé – Gaspesia Region

Harbour Revitalization

Project n° 716211

09/07/2015

Specifications for bid

July 2015

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Rapport d'étude géotechnique, Inspec-sol, novembre 2014
Existing Wharves

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Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 14 00 – Work Restrictions

.2 Section 01 32 18 - Construction Progress Schedules - Bar (Gantt) Charts

1.2 REFERENCES

.1 CCDG - Cahier des charges et devis généraux – Infrastructures routières - Construction et réparation, Gouvernement du Québec.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

.1 This list of work is not necessarily complete and does not relieve the Contractor of his responsibility to carry out any other work, alterations or changes required to complete the work stipulated in this project satisfactorily.

.2 Work of Revitalization of Sainte-Thérèse-de-Gaspé fishing Harbour in the Gaspesia region comprises, but is not limited to:

- .1 The demolition of stone protection and wharf # 401-East and reuse of recovered materials.
- .2 The demolition of the finger wharf # 401 and south Section of wharf # 402 and reuse of recovered materials.
- .3 Partial demolition of the wharf # 401-services area sector and reuse of recovered materials.
- .4 Partial demolition of wharf # 403-South and reuse of recovered materials.
- .5 Dredging and the use of geotextile containers for decontamination of dredged sediments.
- .6 Dredging to expand the basin and reuse of excavated material for the core of the new stone protection or as fill in new service areas
- .7 Disposal of demolition materials that cannot be reintroduced in the new structures
- .8 Reconstruction of wharves # 403-South, # 402-South and all wharf # 401.
- .9 Supply and installation of two (2) ways articulated concrete mats to protect new structures against scouring.
- .10 Supply and installation of stones of various sizes and reuse of existing stone for the reconstruction of a new stone protection for wharf # 401-East.
- .11 Supply and installation of stones of various dimensions for construction of six (6) artificial reefs for lobster offshore fishing harbour of Sainte-Thérèse-de-Gaspé.
- .12 Manufacture and installation of hot dip galvanized steel components (ladders, bollards, cleats, services stations, etc.)
- .13 To ensure continuity of services during the work:
  - .1 Manufacture and installation of floating docks and hot dip galvanized steel components (cleats, overlapping plate, fastening systems, strong arm, cables, etc.)
  - .2 Manufacture and installation of concrete anchor blocks for the floating docks.

.3 Manufacture and installation of aluminum gangway

.14 Supply of granular material and grading and compacting to build the foundation of the surface of wharves and services areas.

.15 Supply and installation of roller compacted concrete and bituminous pavement

1.4 WORK EXTENT

.1 Work included in this project comprises the supply of all materials, labour, tools, equipment, and also protection and transport necessary to execute and finish work accordingly to specifications, in such a manner that the whole property shows uniformity.

.2 Co-ordination and allocation of work among subcontractors is the sole responsibility of the General Contractor, and no reference to subcontractors in these documents shall be construed as binding Canada with respect to any such allocation.

1.5 OWNER OCCUPANCY

.1 Co-operate with departmental representative and harbour authority in scheduling operations to minimize conflict and to facilitate Owner usage.

.2 Contractor shall consider while planning works, that activities in Harbour take place from March to October. Access and wharf shall be available and safe at any time.

.3 Repair or replace, as directed by the Departmental Representative, for connection to the existing structure or an adjacent structure or for alignment with them, the parts of the existing structure that have been modified during construction.

.4 Once the work is completed, existing structures must be in the same or better condition than before the work began.

1.6 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING

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

1.7 EXISTING SERVICES

.1 Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission.

.2 Where Work involves breaking into or connecting to existing services, Departmental Representative 48 hours notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to tenant operations.

.3 Provide alternative routes for personnel, pedestrian and vehicular traffic.

.4 Establish location and extent of service lines in area of work before starting Work. Notify Departmental Representative of findings.

.5 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.

.6 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.

.7 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.8 WORK SEQUENCE

.1 Construct Work in stages, and if possible, as directed by Departmental Representative.

.2 Coordinate Progress Schedule with Departmental Representative.

.3 Works under this contract will be executed in two (2) phases, as shown on the drawings. The first phase (INTERMEDIATE PHASE), which takes place from the notice of acceptance of the offer to March 31, 2016, consists primarily of:

.1 Complete dredging of exclusion zones and related decontamination works for November 1st, 2015

.2 Demolish and rebuild further East, the stone protection

.3 Dredge new basin and existing 2 basins

.4 Rebuild Wharf # 401-Waterfront

.5 Install temporary floating docks for fishing season 2016

.6 Use the dredged material as fill for construction of services areas

.7 Construct electrical distribution networks, water supply and lighting

.8 Construction of artificial reefs for November 15th, 2015.

.4 The completion of phase 2 (FINAL PHASE) will not start until October 1st 2016 and ending March 31, 2017 and include:

.1 Rebuilding wharf # 401- services area

.2 Demolish the finger wharf

.3 Demolish and rebuild the southern section of wharf # 402

.4 Demolish and rebuild the southern section of wharf # 403

.5 Construct electrical distribution networks, water supply and lighting

.5 Paving and construction of the roller compacted concrete slab shall be made in September and October 2017, at the end of fishing season.

.6 The work must observe the following schedule:

.1 Upon receipt of the notice of acceptance of the offer, the Contractor may perform the following work:

.1 Stone production

.2 Purchase of materials for cribwork and floating docks (treated wood, bolts, steel wire, billets, etc.) and the manufacture of steel components and concrete anchor blocks for temporary floating docks.

.2 Upon receipt by the contracting authority and to its satisfaction of the valid certificate of insurance, the Contractor may perform the following work:

.1 Transport of stone and other materials (steel, treated wood, bolts, etc.) at the work site.

.2 Delivery of steel components and concrete anchor blocks.

.3 Demolition of existing structures and Work construction

.3 The Contractor shall, however, adapt their working method to minimize the emission of suspended particles

.4 The Work of Phase #1 and #2 shall be completed by March 31, 2017

.5 Paving and construction of the roller compacted concrete slab shall be made in September and October 2017.

.6 For more information on schedules, refer to Section 01 32 18 - Scheduling bar charts (Gantt)

.7 Sequence activities to limit exposure of partially constructed work to waves, ice and snow storms. Damages to new structures, partially constructed or approved, prior to substantial completion, due to Contractor or subcontractor operations, shall be repaired by Contractor at no additional cost for Departmental Representative.

1.9 CONTRACTOR USE OF PREMISES

.1 Contractor has unrestricted use of site until substantial performance. On the other hand, Contractor shall share wharf access with other users.

.2 Contractor shall limit use of premises for work, storage, and access as indicated on drawings. Parking areas may be used by the Contractor prior to a written agreement with Harbour Authority. Provide a copy of the agreement to the Departmental Representative

.3 Co-ordinate use of premises under direction of Departmental Representative.

.4 If the Contractor wishes to use private land for work or storage space required for operations under this contract, other than those already identified in the plan as reserved for use by the Contractor, the latter shall obtain a written agreement reached between both parties and pay the applicable fees. A copy of this agreement shall be provided to the Departmental Representative.

1.10 CONTINUITY OF SERVICES

.1 Fishing activities normally start in mid-March and ends in mid-October.

.2 Demolition of stone protection and wharf 401 in Phase 1 will cause a loss of mooring capacity in the harbor. To compensate for this loss, Floating docks must be installed and be functional for no later than April 15th, 2016.

.3 To perform dredging work of existing basins, contractor shall remove and reinstall concrete anchor blocks of the 2 existing floating docks system.

.4 The Contractor shall be responsible for the removal and reinstallation of all floating docks lines during Work.

1.11 MEASUREMENT METHOD

.1 Provision of materials, labour, tools, equipment, protection, transport, administration fees, profits, financing, etc., required to perform the work in this undertaking are included in each item described below, unless otherwise indicated.

.2 Measuring method for items will be:

.1 Item No. 1 Site organization

.1 Item will be measured as a lump sum price and includes all items listed in division 1, also items that cannot be assigned to another measurement item.

.2 This item shall include all the necessary work and the means to ensure continuity of services for fishers.

.3 Site organization during work will be paid proportionately with monthly progress payments.

.2 Item No. 2 – Demolition

.1 The "Demolition" item is divided as follows:

.1 Wharves demolition

.2 Stone protection demolition

.3 Contaminated material disposal

.4 Steel Sheet Pile reuse

.2 Wharves Demolition

.1 The item will be measured as a lumps sum price and includes, but is not limited to, all demolition work necessary for construction of new structures. This includes partial or complete demolition of the existing wharves , the cut of steel sheet pile to indicated elevation, demolition of slab and base for bollard and lighting, removal of bituminous pavement and all other incidental work for construction of new structures described in the specifications.

.2 The item also includes the recovering and the delivering to Departmental Representative of the following components:

.1 Rubber fenders

.2 Tie rod anchor blocks

.3 Lights and post

.4 Winch

.5 Other surface accessories

.3 The item also includes costs related to reuse of granular material from demolition work (fill material and crushed concrete) that can be incorporated in new structures, as indicated on drawings and specifications.

.4 This item also includes the removal and handling precautions for the reuse of sheet pile and anchor blocks for tie-rods

.5 This item also includes the costs of loading, transportation and unloading of demolition materials that cannot be reintroduced in new structures and become contractor’s property.

.6 This item also includes the installation of a boom to contain floating demolition materials.

.7 This item also includes disposal of non-contaminated material that cannot be reused in new structures.

.3 Stone Protection Demolition

.1 The item will be measured as a lump sum price and includes, but is not limited to, all demolition work necessary for relocation of stone protection and other work described in this specification. This includes demolition of stone protection of wharf and services area, careful handling of stone to be recovered for reuse in the new structure, and all other incidental work for reconstruction of new stone protection described in the specifications. Stone recovered for demolition work shall be used as quarry-run, filter stone or armour stone in new structures, as indicated in specs.

.2 The item also includes transport and all works for disposal of all materials form demolition work that cannot be reused in new structures.

.3 Reuse of recovered stone for construction of new stone protection is included in Item No. 4.2.6 – Recovered stone.

.4 Disposal of contaminated material

.1 This item will be measured in metric tons and includes the sorting of demolition materials and storage of materials for disposal.

.2 Contaminated demolition materials that may be encountered during the work are:

.1 Materials and leachate from dredging of exclusion zone

.2 Granular backfill materials

.3 Pieces of treated wood and sawdust from cribwork

.3 This includes all the work, precautions and tests relating to the management, removal, disposal or recycling of demolition materials that are contaminated, and that can be disposed of in an engineered landfill site or a site holding a certificate of authorization for such materials in accordance with applicable laws and regulations.

.4 It also includes the set-up of a temporary working area at the work site consistent with the requirements of the Departmental Representative and the regulations governing the handling of contaminated materials.

.5 This item also includes the cost of loading, transporting and unloading demolition materials that cannot be reused in the new structures.

.6 Include all costs incurred for obtaining compliance and operating certificates for the sites used for sorting materials or for disposing of demolition materials.

.5 Reuse of steel sheet pile

.1 This item will be measured as a lump sum price and includes, without limitation, the reuse of sheet pile sections from demolition work to build retaining walls and protective walls backed to:

.1 Stone protection

.2 New services area

.3 Footing of the ice shed

.2 All as specified in drawings and specifications and to Departmental Representative.

.3 It includes all cutting work, handling, care and adjustment related to the installation of the recovered sheet pile sections and reused as retaining or protecting wall, all in accordance with drawing and specifications.

.4 Sections of sheet piles with perforation shall not be used for this purpose and should be considered as demolition materials for recycling or disposal.

.3 Item No. 3 – Dredging

.1 The Item will be measured per theoretical cubic meter according to the estimated volume of material to be excavated for class A-roc and by lump sum price for Class B – unconsolidated deposit and exclusion zones, based on the elevations indicated on drawings.

.2 For measurement purposes, the material to be excavated will be considered part of two classes: Class A (solid rock to be broken using a hydraulic hammer) and Class B (sand, gravel, loose rock, weak rock, etc.).

.3 Surveys will be conducted jointly following the complete demolition of structures and the Class B excavation to determine the theoretical volumes of Class A material to be excavated.

.4 This item will includes the cost of all works needed to excavate and reuse of Class A and good quality without organic material Class B.

.5 This item also includes the installation of a sediment control curtain to retain the particles in suspension.

.6 This item also includes dredging of exclusion zones and decontamination of sediments using the pumping technique and decontamination with geotextile containers system.

.7 In order to guide the Contractor in the quantities preparation of his tender, the Department Representative estimates the quantity of contaminated sediments to be dredged from exclusion zones is approximately 4 500 cubic metres in place measurement and volume of sediments to excavate (under existing structures and outside harbour) to build new basin is approximately 20 000 cubic metres in place measurement.

.8 This item also includes the fill of dredged exclusion zones with clean excavated sediments.

.9 These materials, once in the geotextile container, may be used as sub-foundation for new service area structure.

.10 For information, the top of superficial deposit is composed of silty sand with high organic matter and marine organism (seaweed, shellfish,

molluscs, etc.). The core of superficial deposit is a glacial till composed of silty sand and gravel.

.11 For information, the humidity content of sediments is generally in the range of 50% to 70%.

.12 The "Dredging" item is divided as follows:

.1 Class A - rock

.2 Class B – unconsolidated deposit

.3 Dredging and decontamination of exclusion zones

.4 Item No. 4 – Stone and aggregates

.1 This item is divided as follows:

.1 Supply and installation of stone

.1 9 mt @ 15 mt

.2 6 mt @ 10 mt

.3 1 mt @ 2 mt

.4 0.5 mt @ 1 mt

.5 300 kg @ 500 kg

.6 150-25mm

.7 20-0mm

.8 Recovered stone

.9 Artificial reef

.2 The items, except for item .9 - Recovered stone and .10 - Artificial reef that will be measured as a lump sum price, will be measured in metric tons. The unit price includes all costs involved in producing, transporting, sorting, weighing and implementing materials, including the Contractor's quality control activities, pre-production activities required for the approval of the source of materials, and activities required throughout production, namely the control plan for stone materials and monitoring and spot-check surveys required to complete the structure as specified. All as described in this section and in Section 01 45 01 – Quality Assurance, and in Section 35 31 23 – Rubble Mound Breakwaters.

.3 Measure the materials for the filter stone, armour stone and core in metric tons of materials installed, according to the exact dimensions indicated on the plans.

.4 The payment amount shall be determined by the weigh tickets from certified scales, less all deductions for stone that is refused or beyond tolerance limits.

.5 The calculation of stone installed beyond tolerance limits, which the Departmental Representative agrees to leave as is, must be based on the spot-check surveys carried out during construction. The volume of this stone shall be determined by the average cross-sectional area method. It shall be converted to tons at 1.8 tons/cubic meter and the resulting tonnage shall be deducted from the payment. Material lost or used by the Contractor for any other purpose as well as material not installed in the structure in

accordance with the requirements and plans shall also be deducted from the payment.

.6 No payment shall be made until an appropriate stone control plan has been submitted by the Contractor and reviewed by the Departmental Representative.

.7 Under the provisions of article 10.2.3 of the CCDG, all expenses related to the installation, maintenance, material, weigher required at the weigh station and scale are included in the unit price of materials incorporated into the structure.

.8 Item .9 – Recovered stone will be measured as a lump sum unit and includes the reuse of stone from demolition work (armour, filter, quarry-run or fill material) and can be used in new structures, as indicated in specs and drawings.

.9 Item .10 Artificial reefs will be measured as a lump sum unit and includes the supply of stone, equipment, machinery, labor and after work survey for the installation of six artificial reefs offshore the fishing harbor of Sainte-Thérèse-de-Gaspé.

.5 Item No. 5 – Cribwork

.1 This item is divided as follows:

.1 Cribwork

.2 The 254 mm x 254 mm treated wooden pieces, the hardwood sheathing and galvanized Bolt products will be supplied by Departmental Representative. A purchase note will be provided to Contractor for validation of quantity within two (2) weeks of notice of acceptance of offer. Wood to be stored at least than 1 km of Worksite by using 132 road.

.3 This item will be measured per theoretical cubic meter of wooden cribwork to be built and includes, but is not limited to, all work required for the construction of the wood cribwork. It includes labour, tools, equipment, geotextiles, 150-25 mm crushed stone for the foundation of the crib structures and 300-500 mm ballast stone as well as all work needed for construction consistent with the specified requirements.

.4 This item also includes the disposal of construction waste and all operations required for setting up salvageable materials for the new structures.

.5 Quantities will be calculated according to the theoretical dimensions or those authorized by the Departmental Representative.

.6 Item no 6 – Concrete

.1 The item will be measured as a lump sum price based on elements set in place as indicated in plans. It includes the concrete, the reinforced steel, construction and expansion joints, additives, formwork, equipment, materials, labour and transport.

.2 Item includes supply and installation of all types of steel hardware and anchors. It includes hot dip galvanizing if required.

.3 Heating of water and aggregates and provision of cold weather and hot weather protection, the cooling of concrete and the concrete curing procedures are also included.

.4 The cooling of concrete and hot weather protection will not be measured but considered an integral part of the work.

.5 Item is divided as follow

.1 Bollards and lighting base

.2 Anchor blocks

.3 Articulated concrete mats

.7 Item no.7 – Tie-rods

.1 This item will be measured as a lump sum. It includes the supply and installation of the tie-rods, fasteners, couplers, locknuts, bearing plates and 25 mm stone and all necessary work for the entire installation of tie-rods. Anchor blocks for tie-rods are the existing recovered blocks and reuse is included in the item.

.8 Item no 8 – Wheelguard

.1 This item will be measured in linear meter. It includes material, workmanship and equipment to install wheelguard as indicated in specs and drawings.

.9 Item no 9 – Sheathing

.1 This item will be measured as theoretical square meter surface to cover. It includes the supply of labor and equipment to install sheathing, bolts, nuts, welding works, plates and all necessary works.

.2 The item is divided as follows:

.1 Hardwood sheathing

.2 Recycled plastic sheathing

.10 Item no 10 – Fenders

.1 This item will be measured as a lump sum. It includes the supply of labor, bolt products, steel plates and equipment to install recovered rubber fenders bolts, nuts, welding works, plates and all necessary works.

.11 Item no 11 - Steel

.1 This position is measured by unit supplied and installed

.2 It includes the supply and installation of steel components, including all hardware for installation.

.3 For recovered bollards, it includes sand blasting, partial repair works, application of a coating system, installation, including all hardware and other work for a complete installation.

.4 It includes the manufacture and installation of new bollards, including hardware and other work for a complete installation.

.5 It includes the supply and installation of mooring cleats including hardware for a complete installation.

.6 It includes the supply and installation services station, including hardware, works and adjustments for a complete installation.

.7 Hot dip galvanizing of steel components is part of this item.

.8 It also includes hardware, adjustments and tests required for complete installation.

.9 This item is divided as follows:

.1 Ladders
.2 Recovered bollards
.3 New bollards
.4 Cleats
.5 Services station

.12 Item no 12 - Landscaping

.1 The roller compacted concrete will be measured in square meter and includes the concrete, joints, admixtures, equipment, labour, transport and installation, in accordance with specifications. Furthermore, one test of suitability could be required by the Departmental Representative and will have to be included.

.2 Include chamfers and the supply and installation of joint sealer and the finish.

.3 Heating of water and aggregates and provision of cold weather and hot weather protection, the cooling of concrete and the concrete curing procedures are also included.

.4 The quantities of concrete will be measured according to the theoretical dimensions or approved by Departmental Representative and no deduction of the volume of concrete will be made for reinforcing steel and the openings lower than 0.1 m^2.

.5 The bituminous pavement will be measured by square meter of asphalt concrete set up, according to limits indicated on drawings. It includes the cleaning of the surface to remove waste and crumbled concrete, the supply of materials, the labour and the equipment necessary for the realization of work.

.6 The work consists of remaking the surface of a section of the access road and minor repairs to pavement in other work areas.

.7 Stone and granular materials will be measured by metric tonne. The unit rates include the supply, weighing, transportation, installation and compaction as directed drawings and specifications. Only materials incorporated as directed on drawings and specifications will be considered.

.8 This item is divided as follows:

.1 Roller compacted concrete (RCC)
.2 Bituminous pavement

.13 Item No. 13 – Floating docks

.1 This item will be measured as a lumps sum price for the item Steel Components and Installation, and as a unit price for the items Floating docks, Strong arm, Gangway Base and Gangway, and includes, but is not limited to, the work, labour, equipment and supply of bolt products, steel wire and components, works and adjustment required for installation of the floating docks.

.2 The item includes the manufacture of treated wooden floating docks, manufacture and hot dip galvanization of fastening system, strong arm and other steel components.

.3 The item also includes the construction and installation of concrete anchor blocks.

.4 The item steel component includes, but is not limited to, the manufacturing, hot dip galvanizing of fastening systems between floating docks, strong

arms and their fastening system, antiskid overlap plates and cleats. It also includes the supply of the galvanised hardware, wires and accessories.

.5 The item also includes the supply and installation of a heavy-duty aluminum gangway with a capacity of 4.8kN/m^2, as indicated in specifications and drawings

.6 This item is divided as follows:

.1 Floating docks

.2 Strong arm

.3 Gangway Base

.4 Steel components

.5 Gangway

.6 Installation

.14 Item No. 14 – Services

.1 This item will be measured as a lumps sum price and includes, without limitation, all the work necessary to achieve electrical works according to Section 26 05 01 - Electrical - General Requirements for the results of the work, including interventions to networks and existing electrical installations.

.2 It includes the supply of materials, equipment and labor to carry out power supply of winches, installation of services station and accessories, components installation for a new lighting system, and all necessary work, all as specified in specifications and drawings.

.3 A list of equipment supplied by Departmental Representative is included in Section 26 05 00 – Common Work Results for Electrical.

.4 The item also includes supply and installation of empty conduits, fitting and fastenings.

.5 Include the supply and installation of all equipment and electrical equipment required as specified and the grounding.

.6 Include the supply and implementation of all interventions required for networks and existing electrical installations materials.

.7 The item includes supply and installation of FRE conduits with wires and pulling boxes, connecting of electrical components, and all necessary work.

.8 The item Water supply will be measured as a lump sum and includes the supply of materials, equipment and labor to carry out installation of a new water distribution network and all work, as specified in the plans and specifications.

.9 This item is divided as follows:

.1 Winch

.2 Services station components

.3 Lightning

.4 Water supply

.3 The global lump sum that contractor had to furnish at item SA-03 of bid forms shall be detailed and furnished as indicated at article 1.10.4 to Departmental Representative within 2 weeks after notice of acceptance of offer.

1.12 DOCUMENTS REQUIRED

.1 Maintain at work site, one copy of each document mentioned above:

- .1 Contract drawings
- .2 Specifications
- .3 Addenda
- .4 Reviewed shop drawings
- .5 List of outstanding shop drawings
- .6 Change orders
- .7 Other modifications to Contract
- .8 Field test reports
- .9 Copy of approved work schedule
- .10 Health and safety plan and other safety related documents
- .11 Other documents as specified

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 DESCRIPTION

.1 This section specifies requirements for truck weigh scales, unless otherwise specified, for weighing of materials where measurement for payment is based on mass.

1.2 REQUIREMENTS OF REGULATORY AGENCIES

.1 Prior to use weigh scales, obtain certification meeting requirements of Weights and Measures Act. Display certificate in a prominent position.

Part 2 Products

2.1 MATERIAL

.1 Weigh scales: supply a scale of sufficient capacity to weigh loaded vehicles in a single operation and with on automatic printer.

.2 Cabin:

.1 Provide a cabin with a mass indicator and in which Contractor's representative can perform work and maintain records.

.2 The cabin will be weatherproof and have minimum 750 lx of illumination, one sliding window facing scale platform, one other window for cross ventilation, shelf desk at least 0.6 x 1.8 m, and heat to maintain inside temperature at 20°C. Entrance door not facing scale platform. The lighting and heating systems must be approved by Departmental Representative.

.3 The Contractor shall provide weight tickets.

Part 3 Execution

3.1 INSTALLATION

.1 Provide, install and maintain scale and scale house convenient to project site, at location approved by Departmental Representative. However the contractor is still responsible to verify that the loaded vehicles do not excess the limits allowed on the roads he intends to use.

.2 Remove scale and scale house when no longer required by Departmental Representative, level approach and exit ramps.

3.2 WEIGHING

.1 Contractor's representatives at scales will weigh monitor weighing of materials.

3.3 MAINTENANCE

.1 Maintain scale platform and scale mechanism clean and free from gravel, asphalt, snow, ice and debris.

.2 Maintain approach and exit ramps in good condition free from sags and ruts.

.3 Have scales recertified if requested by Departmental Representative at no cost for Departmental Representative.

3.4 OPERATION

.1 Include costs of certification, installation, maintenance and removal of scale and cabin in items of work to be measured by mass.

.2 The wages for the Contractor's representative at the scale are to be paid by the Contractor with no cost for Departmental Representative.

3.5 ACCEPTATION OF MATERIALS

.1 The acceptation of materials shall be made on the work site.

.2 The contractor is responsible for the materials to comply with the specifications.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 32 18 - Construction Progress Schedules - Bar (Gantt) Charts

.2 Section 01 35 43 – Environmental Procedures

.3 Section 01 56 00 – Temporary Barriers and Enclosures

1.2 ACCESS AND EGRESS

.1 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.3 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. For more information on harbour activities, contact:

.1 M. Travis Henry Tel : 418 368-6075

.2 Maintain the existing utilities services and provide personnel and vehicles with access to the work site.

.3 Where security is reduced by work provide temporary means to maintain security.

1.4 EXISTING SERVICES

.1 Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission.

.2 If taps on existing networks or connections to these networks are necessary, give the Departmental Representative 48 hours' notice before the scheduled interruption of electrical services or mechanical systems.

.3 Keep the duration of interruptions to a minimum and ensure interruptions occur after the occupants' regular work hours, preferably on weekends.

.4 Provide traffic control and construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

.5 Maintain safe navigation in harbour entrance and inside harbour.

1.5 SPECIAL REQUIREMENTS

.1 Complete dredging of exclusion zones and related decontamination works for November 1st, 2015

.2 Work shall be completed as described in Section 01 32 18 – Construction Progress Schedules.

.3 Contractor shall comply with environmental limitation mentioned in Section 01 35 43 – Environmental Procedures.

.4 Develop and submit construction progress schedule in accordance with Section 01 32 18 – Construction Progress Schedules.

.5 Ensure that Contractor personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.

.6 Keep within limits of work, and avenues of ingress and egress free of obstacles.

.7 In his construction schedule, the Contractor shall ensure the continuity of operations by other users during the work period.

.8 The Contractor is responsible for obtaining, from harbour authority officials, all relevant information concerning activities in the fishing harbour. Plan and carry out the work so as not to hamper fishing activities or impede access to port facilities.

1.6 NAVIGATION INTERFERENCE

.1 It is of Contractor's responsibility to get from harbour authorities all information necessary to perform his activities in the harbour. Contractor shall plan and execute work in such manner that it will not interfere with usual operations, or limit access to wharf, by land or water.

.2 Contractor is responsible for loss of time, equipment, material or any other cost related to interference with moored vessels, displacements of ships in harbour or other impacts Caused by Contractor's operations.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

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

.2 Section 35 31 23 – Rubble Mound Breakwater

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

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

1.3 APPOINTMENT AND PAYMENT

.1 Departmental Representative will appoint and pay for services of testing laboratory except 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 Mill tests and certificates of compliance.
- .4 Tests specified to be carried out by Contractor under the supervision of Departmental Representative.

.2 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, pay costs for additional tests or inspections as required by Departmental Representative to verify acceptability of corrected work.

1.4 CONTRACTOR'S RESPONSIBILITIES

.1 Provide labour, equipment and facilities to:

- .1 Provide access to Work 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 sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.

.3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.

.4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Departmental Representative.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 DEFINITIONS

.1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.

.2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.

.3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.

.4 Construction Work Week: Monday to Friday, inclusive, will provide 5 day-work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.

.5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.

.6 Master Plan: summary-level schedule that identifies major activities and key milestones.

.7 Milestone: significant event in project, usually completion of major deliverable.

.8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision-making throughout project life cycle.

.9 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones.

1.2 REQUIREMENTS

.1 All work of phase #1 and #2 shall be completed no later than March 31st 2017, when Substantial Performance Certificate to be delivered as defined times of completion.

.2 Construction Work of pavement and roller compacted concrete slab shall be completed non later than October 31st, 2017.

.3 The reefs shall be built no later than November 15th, 2015.

.4 Complete dredging of exclusion zones and related decontamination works for November 30th, 2015

.5 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.

.6 Plan to complete Work in accordance with prescribed milestones and time frame.

.7 Limit activity durations to maximum of approximately 10 working days, to allow for progress reporting.

.8 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Certificate of substantial performance and Final Certificate as defined times of completion are of essence of this contract.

.9 The implementation schedule and Bar (Gantt) Chart shall reflect the work schedule as per the steps described in item 1.5.

.10 The construction Progress Schedule and the Bar (Gantt) Chart shall take into consideration restrictions to respect during the period of piles installation as described in Section 01 35 43 – Environmental Procedures.

1.3 SUBMITTALS

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

.2 Submit to Departmental Representative within 10 working days of Notice of acceptance of the offer, the Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

.3 Submit Project Schedule to Departmental Representative within 5 working days of receipt of acceptance of Master Plan.

.4 The Contractor shall be responsible for the information required to set up the work schedule. The Contractor shall submit to the Departmental Representative information concerning the work operations and sequence, the breakdown of the work into activities and the duration of these activities.

.5 Work schedules are submitted subject to approval by the Departmental Representative. The Departmental Representative may require additional schedules or reports to demonstrate timely progress in the work or any other project deadline or indication of unrealistic performance.

.6 Approval of work schedules by the Departmental Representative does not release the Contractor from its obligation to complete the work in accordance with the contract documents. Approval of the submitted schedules by the Departmental Representative shall not make the latter liable for time or cost overruns resulting from delays in the schedule.

.7 The work implementation schedule and monthly schedule updates shall be provided to the Departmental Representative for review with each request for payment as a condition of processing the payment request.

.8 The Departmental Representative and the Contractor shall revise the updated work schedule at each progress meeting. The Contractor shall revise the schedule to incorporate changes made during the progress meetings.

.9 When the deadlines or the completion date are not met, the Contractor shall, at no additional cost to the Departmental Representative, undertake one or more of the following: increase labour, increase working hours or take other actions to eliminate work delays.

1.4 PROJECT MILESTONES

.1 Steps to be identified or considered when planning the work are.

.2 Phase 1: take place from notice of acceptance of offer to April 15th, 2016 and consist to

- .1 Demolish and rebuild far East the stone protection
- .2 Complete dredging of exclusion zones and related decontamination works for November 1st, 2015
- .3 New basin and 2 existing basins dredging
- .4 Rebuild wharf #401- ashore
- .5 Installation of temporary floating docks for 2016 fisheries season
- .6 Use of dredging material as filling material for services area
- .7 Build electrical network, water supply and lighting.

.3 Phase 2: take place from October 1st, 2016 to March 31st 2017 and consist to

- .1 Rebuild wharf #401-services area
- .2 Demolish spur wharf
- .3 Demolish and rebuild wharf #402 –South
- .4 Demolish and rebuild wharf #403-South
- .5 Build electrical network, water supply and lighting.

.4 Surfaces construction: take place from September 1st, 2017 to October 31st 2017.

1.5 MASTER PLAN

.1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar (GANTT) Chart.

.2 Departmental Representative will review and return revised schedules within 5 working days.

.3 Revise impractical schedule and resubmit within 5 working days.

.4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

.5 Contractor shall be responsible for information required to develop the construction schedule. Contractor shall provide Departmental Representative with information regarding work operations, sequence of work, breakdown of the work into activities, and time estimates for the activities.

1.6 PROJECT SCHEDULE

.1 Develop detailed Project Schedule derived from Master Plan.

.2 Ensure that detailed Project Schedule includes as minimum milestone and activity types as follows:

- .1 Award
- .2 Shop Drawings, Samples
- .3 Permits
- .4 Mobilization
- .5 Stone delivery
- .6 Material delivery
- .7 Dredging
- .8 Demolition of wharves
- .9 Demolition of stone protection
- .10 Excavation
- .11 Retaining wall Works
- .12 New Stone protection construction
- .13 Installation of new floating docks
- .14 Installation of accessories (ladders, bollards, cleats, wheelguard)
- .15 Build electrical and water supply network.
- .16 Winch installation
- .17 Demobilization

1.7 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.

.2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

.3 The approval of Project Schedule by the Departmental Representative does not relieve the Contractor of his obligation to achieve works according to specifications. The acceptance of submitted Project Schedule by Departmental Representative will not make him responsible for goings of time or costs resulting from delays.

.4 Both Departmental Representative and Contractor will have to update the Project Schedule at each site meeting. The Contractor will have to modify the Project Schedule in order to include the modifications that are done.

.5 When the limit date or work achievement date will not be respected, the Contractor will, and this without additional fees for Departmental Representative, have to take one or more following actions: increase labour, working time, or take other action in order to eliminate delays.

1.8 PROJECT MEETINGS

.1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.

.2 Weather related delays with their remedial measures will be discussed and negotiated.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Partie 1 General

1.1 RELATED SECTIONS

.1 Section 01 45 00 - Quality control

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 and mock-ups 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 shop drawings bearing stamp and signature of qualified professional engineer registered or licensed in the Province of Québec, Canada.

.3 Coordinate the submission of necessary documents or samples in accordance with work and contract document requirements. Documents or samples submitted individually will not be verified until all related information is available.

.4 Use the bid register and transmittal form. The exact format of bid documents shall be approved by the Departmental Representative and accepted by the Contractor.

.5 Identify potential stakeholders in the project, such as the Contractor, subcontractors and suppliers, as well as all sections of the specifications, shop drawings and details relating thereto.

.6 Leave a space on the documents for the "Document Verification" stamp by the Contractor and Departmental Representative.

.7 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.

.8 Allow 5 days for Departmental Representative's review of each submission.

.9 Adjustments made on shop drawings 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.

.10 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.

.11 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

.12 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.

.13 After Departmental Representative's review, distribute copies.

.14 Submit 3 copies of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.

.15 Submit 3 copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.

.16 Delete information not applicable to project.

.17 In addition to routine information, provide any additional details that apply to the work.

.18 Make necessary referrals of contract documents to the appropriate parties.

.19 Submit 3 copies 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 accord with specified requirements.

.2 Testing must have been within 3 years of date of contract award for project.

.20 Submit three (3) copies of certificates for requirements requested in specification Sections and as requested 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.

.21 Supplement standard information to provide details applicable to project.

.22 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies 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.

.23 Review of shop drawings is for sole purpose of ascertaining conformance with general concept. 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 all requirements of construction and Contract Documents. Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for

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

1.4 SAMPLES

.1 Submit for review samples in duplicate 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 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 PHOTOGRAPHS SHOWING WORK PROGRESS

.1 The Contractor shall take photographs during construction to show work progress.

.2 The Departmental Representative shall receive a set of all photographs taken. The Contractor shall receive written notice from the photographer stating that the Departmental Representative may use any photographs without restriction for future purposes. A copy of this notice shall be provided to the Departmental Representative and the contracting authority.

.3 Photographs of the work site showing major construction activities shall be taken at least once a week. The date the photographs were taken shall appear on the front of the photographs.

1.6 MOCK-UPS

.1 Erect mock-ups in accordance with 01 45 00 - Quality Control.

1.7 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit Workers' Compensation Board status.

.2 The Contractor shall:

.1 When specified in individual Specification Sections, submit certification by manufacturer to Departmental Representative, in quantities required.

.2 Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

.3 Certificates may be recent or previous test results on material or Product, but must be acceptable to Departmental Representative.

1.8 PRODUCT DATA

.1 1 The Contractor shall:

.1 Submit the number of copies that the Contractor requires, plus two copies to be retained by Departmental Representative.

.2 Mark each copy to identify applicable products model, option, and other data. Supplement manufacturers' standard data to provide information unique to the Project.

Partie 2 Products

2.1 NOT USED

.1 Not Used.

Partie 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Signalisation routière - volume 1 et 2, Normes d'ouvrages routiers, Ministère des transports du Québec.

1.2 PROTECTION OF PUBLIC TRAFFIC

.1 Comply with requirements of Acts, Regulations and By-Laws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment.

.2 When working on travelled way:

.1 Place equipment in position to present minimum of interference and hazard to travelling public.

.2 Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.

.3 Do not leave equipment on travelled way overnight.

.3 Do not close any lanes of road without approval of Departmental Representative. Before re-routing traffic erect suitable signs and devices in accordance with instructions contained in Signalisation routière from Ministère des transports du Québec.

.4 Keep travelled way graded, free of potholes and of sufficient width for required number of lanes of traffic.

.5 As indicated by Departmental Representative, provide detours or temporary roads to facilitate passage of traffic around restricted construction area:

1.3 INFORMATIONAL AND WARNING DEVICES

.1 Provide and maintain signs and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.

.2 Supply and erect signs, delineators, barricades and miscellaneous warning devices as specified in Signalisation routière from Ministère des transports du Québec.

.3 Place signs and other devices in locations recommended in Signalisation routière from Ministère des transports du Québec.

.4 Meet with Departmental Representative prior to commencement of Work to prepare list of signs and other devices required for project. If situation on site changes, revise list to approval of Departmental Representative.

.5 Continually maintain traffic control devices in use by:

.1 Checking signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.

.2 Removing or covering signs which do not apply to conditions existing from day to day.

1.4 CONTROL OF PUBLIC TRAFFIC

.1 Not Used.

1.5 OPERATIONAL REQUIREMENTS

.1 Access to harbor must be maintained at all times for users that their boat is wintered in the harbor as well as emergency services..

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Contractor shall manage his operations so that safety and security of the public and of site workers always take precedence over cost and scheduling considerations.

.2 Various aspects of health and safety that DFO must take into account to exercise due diligence in terms of health and safety on Work sites.

1.2 REFERENCES

.1 Canada Labour Code - Part II, Canadian Occupational Safety and Health Regulations.

.2 Canadian Standards Association (CSA)

.3 Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.4 Act Respecting Occupational Health and Safety, R.S.Q. Chapter S-2.1.

.5 Construction Safety Code, S-2.1, r.6.

.6 *Canada Shipping Act* and *Navigable Waters Protection Act*

1.3 SUBMITTALS

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

.2 Submit to Departmental Representative, the CSST and the Association paritaire en santé et sécurité du secteur de la construction (ASP Construction) the site-specific safety program, as outlined in 1.8 at least 10 days prior to start of work. The Contractor must review his program during the course of the project if any change occurs in work methods or site conditions. The Departmental Representative may, after receiving the program or at any time during the project, ask the Contractor to update or modify the program in order to better reflect the reality of the construction site and activities. The Contractor must make the required changes before work begins.

.3 Submit to Departmental Representative the site inspection sheet, duly completed, at the intervals indicated in 1.12.1.

.4 Submit to Departmental Representative within 24 hours a copy of any inspection report, correction notice or recommendation issued by federal or provincial inspectors.

.5 Submit to Departmental Representative within 24 hours an investigation report for any accident involving injury and any incident exposing a potential hazard.

.6 Submit to Departmental Representative all safety data sheets for hazardous material to be used at the site at least three days before they are to be used.

.7 Submit to Departmental Representative copies of all training certificates required to apply the safety program, in particular:

.1 General construction site safety and health courses;

.2 Safety officer attestations;

.3 First aid in the workplace and cardiopulmonary resuscitation;

.4 Wearing and fitting of individual protective gear;

.5 Forklift truck;

.6 Positioning platform;

.7 Any other requirement of Regulations or the safety program.

.8 Medical examinations: Wherever legislation, regulations, directives, specification or a safety program require medical examinations, Contractor must:

.1 Prior to start-up, submit to Departmental Representative certificates of medical examination for all concerned supervisory staff and employees who will be on duty when the site opens.

.2 Thereafter, submit without delay certificates of medical examination for any newly hired concerned personnel as and when they start work at the site.

.9 Emergency plan: The emergency plan, as defined in 1.8.3, shall be submitted to Departmental Representative at the same time as the site-specific safety program.

.10 Notice of site opening: Notice of site opening shall be submitted to the Commission *de la santé et de la sécurité du travail* before work begins . A copy of such notice shall be submitted to Departmental Representative at the same time and another posted in full view at the site. During demobilization, a notice of site closing shall be submitted to the CSST, with copy to Departmental Representative.

.11 Engineer’s plans and certificates of compliance : Submit to the CSST and to Departmental Representative a copy signed and sealed by engineer of all plans and certificates of compliance required pursuant to the Construction Safety Code (S-2.1, r. 6), or by any other legislation or regulation or by any other clause in the specifications or in this contract. Copies of these documents must be on hand at the site at all times.

.12 Certificate of compliance delivered by the CSST: The certificate of compliance is a document delivered by the CSST confirming that the contractor is in rule with the CSST, i.e. that he had pay out all the benefits concerning this contract. This document must be delivered to Departmental Representative at the end of the work.

1.4 HAZARDS ASSESSMENT

.1 The contractor must identify all hazards inherent in each task to be carried out at the site.

.2 The contractor must plan and organize work so as to eliminate hazards at source or promote mutual protection so that reliance on individual protective gear can be kept to a minimum. Where individual protection against falling is required, workers shall use safety harness that meets standard Can - CSA- Z-259.10 - 06. Safety belts shall not be used as protection against falling.

.3 Equipment, tools and protective gear which cannot be installed, fitted or used without compromising the health or safety of workers or the public shall be deemed inadequate for the work to be executed.

.4 All mechanical equipment shall be inspected before delivery to the site. Before using any mechanical equipment, submit to Departmental Representative a certificate of compliance signed by a qualified mechanic. Whenever he suspects a defect or accident risk, Departmental Representative may at any time order the immediate shut-down of equipment and require a new inspection by a specialist of his own choosing.

1.5 MEETINGS

.1 Contractor decisional representative must attend any meetings at which site safety and health issues are to be discussed

.2 Set up a site safety committee, and convene meetings in accordance with the Construction Safety Code.

1.6 LEGAL AND REGULATORY REQUIREMENTS

.1 Perform Work in accordance to Section 01 41 00 – Regulatory Requirements

.2 Comply with all legislation, regulations and standards applicable to the site and its related activities.

.3 Comply with specified standards and regulations to ensure safe operations at site containing hazardous or toxic materials.

.4 Regardless of the publication date shown in the construction safety code, always use the most recent version.

1.7 SITE-SPECIFIC CONDITIONS

.1 In his work planning, Contractor shall not disturb Harbour activities

.2 Workers to be exposed to the following conditions:

.1 Work near watercourse.
.2 Work involving risk of drowning.
.3 Marine work with difference of tide of around 1.7 metres and water depth near 4 metres under chart datum.
.4 Works with treated wood

.3 The weather conditions may be difficult (wind, cold, etc…). Harbour may be exposed to heavy agitation caused by waves and also moving ice floes.

.4 Old steel piles wharves are in a very advanced state of deterioration. Any traffics is therefore prohibited.

.5 The continuity of various maritime services shall be maintained in a safe manner throughout the duration of the works.

.6 Until final acceptance, the protection of work for work stability and workers' security during work progress remains under Contractor's responsibility.

1.8 SAFETY AND HEALTH MANAGEMENT

.1 Acknowledge and assume all the tasks and obligations which customarily devolve upon a principal Contractor under the terms of the Act Respecting Occupational Health and Safety (R.S.Q., chapter S-2.1) and the Construction Safety Code (S-2.1, r.6).

.2 Develop a site-specific safety program based on the hazards identified and apply it from the start of project work until close-out is completed. The safety program must take account of all information appearing in 1.7 and must be submitted to all parties concerned, in accordance with the provisions set forth in 1.2. At a minimum, the site-specific safety program must include:

.1 Company safety and health policy.
.2 A description of the work, total costs, schedule and projected workforce curve.
.3 Flow chart of safety and health responsibility.
.4 The physical and material layout of the site.
.5 First-aid and first-line treatment standards.
.6 Identification of site-specific hazards.
.7 Risk assessment for the tasks to be carried out, including preventive measures and the procedures to apply them.
.8 Training requirements.
.9 Procedures in case of accident/injury
.10 Written commitment from all parties to comply with the prevention program.
.11 A site inspection schedule based on the preventive measures.

.3 The contractor must draw up an effective emergency plan based on the characteristics and constraints of the site and its surroundings. Submit the emergency plan to all parties concerned, pursuant to the provisions of 1.2.The emergency plan must include:

.1 Evacuation procedure;
.2 Identification of resources (police, firefighters, ambulance services, etc.);
.3 Identification of persons in charge at the site;
.4 Identification of those with first-aid training;
.5 Training required for those responsible for applying the plan;
.6 Any other information needed, in the light of the site characteristics.

.4 For all work involving risk of drowning, conform to following requirements:

.1 Comply with the Safety Code for the Construction Industry, paragraph 2.10.13.
.2 Ensure that required life vests are conforming to:
  .1 CAN/GGSB-65.7-2007, Life Jackets, Inherently Buoyant published by the Canadian General Standards Board (CGSB).
  .2 Or exceptions to be approved by Transport Canada.

.3 Obtain and submit to Departmental Representative a letter of compliance issued by Transport Canada for approval of any craft (transportation, rescue, inspection or other) prior to commencement of work

.4 Ensure that a rescue craft is moored, in the water and available for every shift. When craft is accessible by land, it can be used by several work locations provided that distance between each work location and craft is less than 100 metres.

.5 Ensure that craft is equipped with a motor powerful enough to travel upstream.

.6 Ensure that craft has required characteristics to carry individuals likely to participate in a rescue operation.

.7 Ensure that craft is available for personnel at all times in case of emergency.

.8 Ensure that a qualified individual is available to operate rescue equipment. Individual must be qualified to operate recreational craft, depending on length of craft used.

.9 Establish written rescue procedures containing the information below and ensure that all personnel concerned by these procedures have received the necessary training and information to apply them.

.1 Complete descriptions of the procedures, including responsibilities of individuals permitted access to place of work.

.2 Location of rescue equipment.

.10 When place of work is a landing wharf, dock, jetty, pier or other similar structure, install a ladder with at least two rungs below surface of water on front of structure every 60 metres. This measure also applies to construction projects. In this case, a temporary (or portable) ladder can be used and removed at end of work if Owner does not have basic facilities. But we have to notify the owner that site is not in accordance with the Canada Labour Code, Part 2.

.5 For diving work, conform to the following requirements:

.1 Professional divers must apply the Standards of the CAN/CSA Z275 related to diving work:

.1 Z275.2 - Occupational safety code for diving operations

.2 Z275.4 - Competency standard for diving, hyperbaric chamber, and remotely operated vehicle operations

.3 Z275.5 - Occupational diver training

.2 The Contractor must ensure that the diver company has a minimum of three (3) persons including:

.1 An active diver who will be connected to the surface;

.2 A stand-by diver ready to intervene;

.3 Tender.

.3 Meet the qualifications of divers under Article 312.8 of the regulation on health and safety (CSST) - Training of members of the diving team:

.1 Within 12 months following June 10th, 2010, each member of the diving team must, depending of diving method and to function it performs: receive a professional diving training according to Occupational diver training standard, CSA -Z275.5-05 and hold a certificate issued by an

eligible educational institution by Ministère de l'Éducation, du Loisir et du Sport that provide such training or by an educational institution recognized by a professional diving to CSST or hold a recognition of competences according to CAN/CSA Z275.4 Occupational safety code for diving operations issued by such institution or organization;

1.9 RESPONSIBILITIES

.1 No matter the size of the construction site or how many workers are present at the workplace, designate a competent person to supervise and take responsibility for health and safety. Take all necessary measures to ensure the health and safety of persons and property at or in the immediate vicinity of the site and likely to be affected by any of the work.

.2 Take all necessary measures to ensure application of and compliance with the safety and health requirements of the contract documents, applicable federal and provincial regulations and standards as well as the site-specific safety program, complying without delay with any order or correction notice issued by the Commission de la santé et de la sécurité du travail.

.3 Take all necessary measures to keep the site clean and in good order throughout the course of the work

1.10 COMMUNICATIONS AND POSTING

.1 Make all necessary arrangements to ensure effective communication of safety and health information at the site. As they arrive on site, all workers must be informed of their rights and obligations pertaining to the site specific safety program. The Contractor must insist on their right to refuse to perform work which they feel may threaten their own health, safety or physical integrity or that of other persons at the site. The Contractor must keep and update a written record of all information transmitted with signatures of all affected workers.

.2 The following information and documents must be posted in a location readily accessible to all workers:

.1 Notice of site opening;
.2 Identification of Principal Contractor;
.3 Company OSH policy;
.4 Site-specific safety program;
.5 Emergency plan;
.6 Data sheets for all hazardous material used at the site;
.7 Minutes of site committee meetings;
.8 Names of site committee representatives;
.9 Names of those with first-aid training;
.10 Action reports and correction notices issued by the CSST.

1.11 UNFORESEEN CIRCUMSTANCES

.1 Whenever a source of danger not defined in the specifications or identified in the preliminary site inspection arises as a result of or in the course of the work, immediately suspend work, take appropriate temporary measures to protect the workers and the public and notify Departmental Representative, both verbally and in writing. Then the Contractor must modify or update the site specific safety program in order to resume work in safe conditions.

1.12 INSPECTION OF SITE AND CORRECTION OF HAZARDOUS SITUATIONS

.1 Inspect the work site and complete the site inspection sheet at least once a week.

.2 Immediately take all necessary measures to correct any lapses from legislative or regulatory requirements and any hazards identified by a government inspector, by the Departmental Representative, by the site safety and health coordinator or during routine inspections.

.3 Submit to Departmental Representative written confirmation of all measures taken to correct lapses and hazardous situations.

.4 Give the safety officer or, where there is no safety officer, the person assigned to safety and health responsibilities, full authority to order interruption and resuming of work as and when deemed necessary or desirable in the interests of safety and health. This person should always act so that the safety and health of the public and site workers and environmental protection take precedence over cost and scheduling considerations.

.5 Without limiting the scope of sections 1.8 and 1.9, Departmental Representative may order cessation of work if, in his/her view, there is any hazard or threat to the safety or health of site personnel or the public or to the environment.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 SUBMITTALS

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

1.2 FIRES

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

1.3 DISPOSAL OF WASTES

.1 Do not bury rubbish and waste materials on site unless approved by Departmental Representative.

.2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

.3 Grade and classify all non reusable demolition materials from wharf to manage their future utilisation or disposal in compliance with all applicable environmental regulations.

.4 All necessary installations for the use of grading and classification of reusable or disposal materials must be plan out of work site and in a safe and predetermined area.

.5 Reusable or recyclable materials from demolition are as follows:

- .1 Different size of stones;
- .2 Steel Sheet pile;
- .3 Concrete from slab and old wharf structure;
- .4 Steel fastening components such as bolt, lag screw, etc;

.6 Information on managing demolition material is found in Section 01 74 21 – Construction/Demolition Waste Management

.7 Contractor shall gradually dispose of non-reusable material from demolition off work site to an authorized site.

.8 Waste materials from demolition and non reusable in the new structure shall be recycle if possible, and if not, the site of disposal shall be approved by the Quebec Ministère du Développement durable et de la Lutte contre les changements climatiques (MDDELCC). Upon request, the department may provide information on the sites in operation. This includes any dry material, waste or rubbish from demolition or construction.

.9 Contractor shall submit a copy of official authorization and permits prior to seek Departmental Representative’s authorization to remove waste materials from work site.

.10 Dispose of contaminated waste and soils according to Québec’s regulation and with Québec’s Soil Protection and Rehabilitation of Contaminated Sites Policy.

1.4 WORK ADJACENT TO WATERWAYS

.1 Do not use banks or waterway beds material for borrow.

.2 Do not dump construction material, waste or debris in waterways.

.3 Cleaning of equipment in the water is prohibited.

.4 Service and refuel vehicles at least 30 m from bank.

.5 Do not store petroleum products or any other hazardous materials less than 30 m from bank.

.6 If for some reasons certain equipment or hazardous products, implying hazardous material handling, should stay beneath 30 m from waterways, Contractor shall submit a contingency plan to the Departmental Representative and get it approved prior to beginning of work. The plan will provide, without being limited to, details as follows:

.1 Designated inner limits of work area for the use of operations;

.2 Handled or stored hazardous products (ex. diesel, waste oils, etc.);

.3 Containment methods used in order to limit contamination during maintenance and refuelling of equipments and vehicles (in case of oil leakage);

.4 The presence of emergency equipment in case of spill near supplying zone and maintenance area.

.5 The procedure for hazardous spill.

.6 A list of contacts in case of hazardous spill.

.7 If generators must be used, make sure that the fuel tank of each generator is with double walls and that it is installed on an impermeable floor with raised kerb to avoid any discharge.

.7 Before work begins and after it is completed, the Contractor shall provide, at its own expense, a characterization of the chemical quality of soil on the site used for refuelling, maintenance and storage of machinery, heavy equipment and storage of demolition and construction materials.

.8 Soil characterization shall be performed by a recognized firm in accordance with the procedures specified by the MDDELC and CCME. The sampling plan and protocol shall be approved by the Departmental Representative.

.9 In the event of soil contamination in the targeted areas as a result of project-related activities, the site shall be restored to comply with its intended use, and the contaminated soil shall be disposed of at an MDDELC-authorized site.

1.5 POLLUTION CONTROL

.1 Materials used shall be inert and exempt from contaminants.

.2 Prevent fine materials and other extraneous materials from contaminating air and water beyond work site.

.3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris.

.4 Control emissions from equipment and plant to local authorities emission requirements.

.5 Use machinery in good operating condition to avoid grease, oil or fuel leaks. Submerged equipment parts shall be clean and free of leaks.

.6 Perform service and verifications before arrival at site. Ensure there are no fuel, oil or grease leaks, and silencer must be in good condition. Repair non-compliant equipment as rapidly as possible (noise or leaks).

.7 Immediately recover any contaminant spill in the environment and dispose of it in accordance with applicable legislation.

.8 Maintain absorbent materials on site at all times for rapid intervention in case of hazardous spill. Know how to use emergency equipment in case of accidental spill. Report any oil spill or other environmental incident to Departmental Representative and authorities having jurisdiction. Recover hydrocarbons and contaminated soil and dispose of in conformance with applicable legislation.

.9 Submit emergency plan related to hazardous spill, with a list of all contributors with their phone number.

.10 Keep on site suitable emergency equipments in case of an accidental spill and ensure the appropriate use of it.

.11 Keep on site, near the work area and near the supplying zone established, an emergency spill response kit. The emergency spill response kit shall contain absorbent material in adequate quantities to remove petroleum from site.

.12 In the event of a hydrocarbons spill or other hazardous material, the Contractor must advise Departmental Representative and authorities having jurisdiction mentioned in the emergency plan. Report immediately the situation to Environment Canada Emergency services (1-866-283-2333), Environment Emergency of Québec (1-866-694-5454) for an on land spills and to Canadian Coast Guard- Marine Accidental Spill Incidents (1-800-363-4735).

.13 Wasted oils and other contaminated wastes shall be managed in compliance with effective regulation. This included storage at site, transportation and elimination.

.14 Do not dispose of volatile materials such as mineral oils and oil or paint thinner in rivers, storm-water or sewers.

.15 Any hazardous waste generated on the work site will have to be conveyed to a well-authorized disposition site by MDDELC.

.16 Hazardous waste storage and transport will have to be done in accordance with the regulation in force in order not to contaminate the environment.

.17 Prior to conveying hazardous waste from work site, the Contractor shall obtain Departmental Representative authorization by showing a copy of all licenses obtained from the owners or hazardous waste disposal site authorities

1.6 TRANSPORT OF MATERIALS

.1 Materials may be transported on public roads to construction site from Monday to Saturday unless notified otherwise by the authorities having jurisdiction. Transport is prohibited on Sundays and public holidays.

.2 Materials may be transported through the city between 7:00 a.m. and 5:00 p.m. (17h00) Transport outside these hours is prohibited.

.3 Ensure proper operation of trucks used. Any trucks or other means of transport creating sound levels that Departmental Representative deems to exceed standards shall cease transporting materials or be repaired or modified to be made acceptable.

.4 Contractor shall use adequate signalization and co-operate with municipality, Departmental Representative and other authorities having jurisdiction to minimize the impact of transportation on the daily lives of residents in area adjacent to truck route and construction site.

.5 Use a sheet to cover granular material during transportation.

.6 Limit traffic for the transportation of material to roads and areas identified in the specifications.

.7 Maintain the roads used in good condition at all times and take the necessary measures to ensure they can be safely used and crossed by other users.

.8 Upon work completion, promptly restore the roads to a condition that is at least equal to their original state.

1.7 PROTECTION OF THE AQUATIC ENVIRONMENT IN THE WORK AREA

.1 The work area should be clearly defined.

.2 Ensure workers are informed of environmental and safety measures.

.3 Do not store stone or debris from demolition on bank.

.4 A boom shall be deployed during the demolition to prevent the drifting of floating debris that may be released during demolition.

.5 A sediment control curtain shall be installed during dredging of exclusion zones.

.6 As work progresses, completely clean bank to recover all debris (wood) from demolition of existing wharf.

.7 The Contractor shall minimize the work in aquatic environment and on bank. At anytime the heavy equipment will be allowed the move outside the work area.

.8 For underwater works required, the Contractor must assure that all equipment pieces involved are free of contamination and of any oil leakage.

.9 Land-based equipment storage shall be made in anytime above high tides level and as conditions described in section 1.5 – Work adjacent to waterways.

.10 Employ a method for removing rocks that involves minimal contact between the sediments and machinery to avoid creating suspended matter. Notably, these rocks must be raised slowly and hoisted directly to the surface, taking care not to drag them on the seabed.

.11 Carefully dispose of the materials on the bottom, especially for the furthest parts, in order to minimize the resuspension of suspended solids (SS); deposit rather than drop the rocks on the seabed.

.12 Work shall be performed when the wave height is equal to or less than 1.5 m in order to minimize the resuspension of SS, as stable manoeuvring would become more difficult with bigger waves.

.13 Keep navigation near the area to a minimum in order to minimize the ripple effect caused by passing boats on the sediment.

.14 When conditions are right, carry out the riprap work or install the crib structures in a dry environment, or at low tide, which significantly mitigates the impacts on surface water quality by limiting SS and noise propagation.

.15 When weather conditions deteriorate, work must be avoided to prevent the dispersion of material resuspended by the work;

1.8 TREATED WOOD AND CONTAMINATED MATERIALS

.1 Treated wood and contaminated materials shall be temporarily stored in leak-proof containers or under waterproof tarps prior to shipping the wood for sorting, removal of metals or other preparations so that the wood and any other contaminated materials can be contained from the soil and protected from the rain and so that runoff does not reach the soil or waterways. For example, wood piles can be placed on a waterproof tarp and covered with another waterproof tarp. Absorbents must be scattered around the piles to capture contaminants.

.2 During the work, take all necessary measures to avoid spreading debris into the aquatic environment:

.1 Store waste and debris at a site distant from the aquatic environment, as agreed with the Departmental Representative.

.2 Quickly retrieve debris or objects released into the aquatic environment.

.3 The Contractor shall provide a log of activities related to the management and disposal of demolition materials.

.3 Treated wood and any other contaminated materials shall be sent to a site authorized by the MDDELC and intended for this purpose.

.4 The Contractor shall provide the Departmental Representative with a copy of authorizations obtained from the owners or managers of disposal sites for creosote-treated wood and other contaminated materials and, if necessary, for soil contaminated by firefighting activities.

1.9 NOISY WORKS

.1 Noisy works are prohibited at night, unless absolutely necessary.

1.10 NOTICE TO SHIPPING

.1 Issue a Notice to Shipping regarding date and duration of work, in accordance with the Navigation Protection Act.

.2 Set up and meet requirements of license emitted under the terms of the Navigation Protection Act

1.11 WORK MONITORING

.1 Mitigation measures from the assessment report, and those mentioned in the present section will be subject to constant monitoring on work site by a Departmental Representative.

.2 The Department Representative will complete an environmental control data record of work site. This control data record will be given to Contractor on a weekly basis.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES AND CODES

.1 All work shall meet or exceed the requirements of the latest edition of the standards of the Canadian Government Specifications Board (CGSB), the Canadian Standards Association (CSA), the National Building Code of Canada (NBC), the American Society for Testing and Materials (ASTM), the Canadian Standard Association (CSA), the American Concrete Institute (ACI), Cahier des charges et Devis généraux (CCDG) from Ministère des Transports du Québec and the other standards and codes referred to herein, including amendments up to tender closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Where conflict arises in the course of work, the strictest standards shall apply.

.3 At any time when the specifications refer to standards, standard to be applied shall be the latest edition available, regardless of the edition designated in specification.

.4 Meet or exceed requirements of:

.1 Contract documents.

.2 Specified standards, codes and referenced documents.

1.2 LAWS, REGULATIONS AND DECREES

.1 Contractor shall conform to all rights and privileges of others, and to all federal, provincial and municipal laws, regulations and decrees; he must also make sure that his employees, in law or in fact, and his subcontractors conform to same.

.2 The applicable permits and approvals will have to be obtained by the Contractor before the beginning of work.

1.3 PERMITS, FEES AND TAXES

.1 Contractor shall give all notices, obtain and pay all fees and construction permits for the demolition and for construction, and for all other services, as required by the authorities having jurisdiction.

.2 Contractor shall be responsible for all damage and costs resulting from default to obtain these fees and permits.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION CONTENT

.1 Inspection and testing, administrative and enforcement requirements

.2 Tests and mix designs

.3 Mock-ups

1.2 RELATED SECTIONS

.1 Section 01 33 00 – Submittal procedures

.2 Section 01 77 00 – Closeout procedures

1.3 INSPECTION

.1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.2 Give timely notice requesting inspection if Work is designated for inspections, approvals or special tests required by Departmental Representative or by 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, have inspections or tests satisfactorily completed 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.

1.4 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative.

.2 Provide equipment required for executing inspection and testing by appointed agencies.

.3 Employment of inspection/testing agencies does not relax responsibility 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 cost to Departmental Representative. Pay costs for retesting and reinspection.

1.5 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.6 PROCEDURES

.1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in 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 to store and cure test samples.

1.7 REJECTED WORK

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage 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 other Contractor's work damaged by such removals or replacements promptly.

.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 REPORTS

.1 Submit 2 copies of inspection and test reports to Departmental Representative

.2 Provide copies to manufacturer or fabricator of material being inspected or tested.

1.9 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as requested.

1.10 MILL TESTS

.1 Submit mill test certificates as required of specification Sections.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 SCOPE

.1 This section outlines the Contractor's responsibilities regarding quality control for all work, including requirements relating to plans, procedures and organization necessary to produce a final product compliant with the expectations listed in the plans and specifications. Quality control must cover all construction operations, both on the work site and elsewhere (e.g. quarries).

.2 Specific requirements for quality control of quarry rock and rock installation are described in Section 35 31 23 – Rubble Mound Breakwaters.

.3 Independent quality assurance activities will be conducted by the Departmental Representative. These activities aim to provide independent observations of compliance with the requirements set out in plans and specifications and in no way relieve the Contractor of its quality control responsibilities. See Section 01 45 00 – Quality Control.

1.2 RELATED SECTIONS

.1 Section 01 45 00 - Quality Control.

.2 Section 02 41 16 – Structure Demolition

.3 Section 35 31 23 – Rubble Mound Breakwater

1.3 QUALITY CONTROL

.1 Contractor obligations:

.1 The Contractor is responsible for quality control and shall establish and maintain an effective quality control program. This includes the personnel, procedures and organization required to produce a final product that meets contract requirements. Quality control must cover all construction operations, both on the work site and elsewhere, and must be adapted to the proposed construction sequence.

.2 The Contractor shall monitor quality control for suppliers, manufacturers, products, services, work site conditions and work activities to produce the specified quality of work.

.3 The Contractor shall comply with manufacturers' instructions for each step of the construction sequence.

.4 If manufacturers' instructions conflict with contract documents, the Contractor shall request clarification from the Departmental Representative before proceeding.

.5 The Contractor shall comply with the specified standards for the minimum quality of work unless there are tolerances for codes or prescribed requirements that require stricter standards or more detailed work.

.6 The Contractor shall perform the work with qualified personnel to produce work of the prescribed quality.

1.4 TOLERANCES

.1 The Contractor shall monitor the control of tolerances to produce acceptable work. The Contractor shall not allow tolerances to accumulate.

.2 The Contractor shall comply with manufacturer and specification tolerances. If manufacturer tolerances conflict with contract documents, the Contractor shall request clarification from the Departmental Representative before proceeding.

1.5 REFERENCES

.1 For products or work prescribed by an association, a construction trade or other recognized standards, the Contractor shall comply with the standards unless more stringent requirements are prescribed or required by applicable codes.

.2 The Contractor shall comply with the reference standards in effect at the time of receipt of bids, except where a specific date is set by the code.

.3 The Contractor shall obtain copies of the standards if required by the specification sections.

.4 Neither contractual relationships nor the duties and responsibilities of the contract parties or those of the Departmental Representative can change with respect to the contract documents by mention or suggestion of any reference document.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 QUALITY CONTROL PHASES

.1 Quality control is a means by which the Contractor can ensure that the construction, including for subcontractors and suppliers, fulfills contract requirements. Quality control must cover all construction operations, both on the work site and elsewhere, and correspond to the proposed construction sequence. It must include at least three control

phases to be carried out by the Contractor's quality control system manager for all definable portions of the work, as follows:

.1 **Preparatory phase:** This phase must be completed before work begins for each definable portion of work and must include:

- .1 A review of each paragraph of the applicable specifications.
- .2 A review of the contract plans.
- .3 A review to ensure all materials and/or equipment have been tested, submitted and approved.
- .4 A review to ensure the required control inspection and testing have been planned.
- .5 A review of the work area to ensure that all required preliminary work has been performed and is consistent with the contract.
- .6 A physical examination of materials, equipment and work samples required to ensure they are available, in accordance with the approved shop drawings or on the required bid submission date, and are properly stored.
- .7 A discussion on construction work procedures, including necessary changes to resolve recurring problems.
- .8 Construction tolerances in documents and work standards for this work phase.
- .9 A review to ensure the Departmental Representative has approved the portion of the quality control plan for the work to be done.

.2 **Initial phase:** This phase must be carried out at the beginning of a definable portion of work. The following must be done:

- .1 A review of the completed work to ensure it complies with contract requirements.
- .2 Review of overall compliance with the contract: Verify inspection and testing required by quality control.
- .3 Establish the level of qualification for the work to be carried out and make sure it meets the minimum acceptable standards for the work. Compare with test sections and approved sample panels, where applicable.
- .4 Correct any differences.
- .5 The initial phase should be repeated for each new team to work on the site or whenever the prescribed minimum acceptable standards are not met.

.3 **Monitoring phase:** Daily checks must be performed to ensure continued compliance with contract requirements, including control testing, until the specific portion of the work is completed. Reviews must be recorded in the Contractor's

quality control documents and submitted to the Departmental Representative. Final monitoring reviews must be performed and all problems must be corrected before the start of a new portion of work that could be affected by the defective work. The Contractor shall not build on or conceal non-compliant work.

3.2 STONE MATERIAL CONTROLPLAN

.1 The Contractor is responsible for establishing and maintaining a quality control plan for quarry materials to ensure that all quarry materials incorporated into the structure comply with specifications. Section 35 31 23 – Rubble Mound Breakwaters outlines the specific requirements for the rock control plan to be implemented by the Contractor for this project.

3.3 SURVEY CONTROL, PROJECT LAYOUT AND STONE PLACEMENT SURVEYS

.1 The Contractor is responsible for establishing and maintaining all land survey controls required to perform the work as described in Section 01 71 00 – Examination and Preparation.

.2 The Contractor is responsible for the project location, including establishing and maintaining the survey control line, and for construction surveys necessary to perform the work required by the contract documents.

.3 The Contractor is responsible for conducting spot-check surveys for all work performed on-site to ensure compliance with requirements. Spot-check surveys will be used to determine payment amounts and must be performed in the presence of the Departmental Representative, unless the latter determines otherwise.

.4 Section 35 31 23 – Rubble Mound Breakwaters outline the specific requirements of land surveys to be conducted by the Contractor, including monitoring surveys, project location, construction surveys and spot-check surveys.

3.4 COMPLETION INSPECTION

.1 Once all the work is completed, the Contractor's quality control manager and the Departmental Representative shall inspect the work and list the elements that are inconsistent with the plans and specifications. The Contractor shall provide an estimated date on which the Contractor's quality control manager and personnel will conduct a second inspection to ensure all defects have been corrected and shall notify the Departmental Representative of the date.

3.5 DOCUMENTATION

.1 The Contractor shall maintain records of operations, activities and quality control tests conducted, including work carried out by subcontractors and suppliers. These records must be in an acceptable format and must include factual evidence that the required

activities and/or quality control testing have been carried out, including, but not limited to, the following:

.1 The Contractor/subcontractor and their area of responsibility

.2 Testing and/or control activities conducted with results and references to plan and/or specification requirements

.3 Identification of elements submitted and reviewed with contract reference

.4 Conflicts with plans and/or specifications

.5 Contract plans as created, including full set of contract plans marked in red to indicate all conditions differing from original plans

.6 Shop drawings having received final approval

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 01 52 00 – Construction facilities

.3 Section 01 56 00 – Temporary barriers and enclosures

1.2 SUBMITTAL PROCEDURES

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

1.3 INSTALLATION AND REMOVAL

.1 Provide temporary utilities controls in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.4 TEMPORARY POWER AND LIGHT

.1 Provide and pay for temporary power during construction for temporary lighting and operating of power tools.

.2 Arrange for connection with appropriate utility company. Pay costs for installation, maintenance and removal.

.3 Temporary power for electric equipment requiring of above is provided by Departmental Representative.

.4 Provide and maintain temporary lighting throughout project. Ensure level of illumination on work site is not less than required by Departmental Representative.

1.5 TEMPORARY COMMUNICATION FACILITIES

.1 Provide and pay for temporary telephone, fax, data hook up, lines and equipment necessary for own use and use of Departmental Representative.

.2 Ensure the connection of these installations with major networks and the costs of these services.

1.6 FIRE PROTECTION

.1 Provide and maintain temporary fire protection equipment during performance of Work required by governing codes, regulations and bylaws.

.2 Burning rubbish and construction waste materials is not permitted on site.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 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 and walkways, according to requirements of authorities having jurisdiction.

.2 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

END OF SECTION

Part 1 General

1.1 SECTION CONTENT

.1 Construction aids

.2 Office and sheds

.3 Parking area

.4 Project identification

1.2 RELATED SECTIONS

.1 Section 01 51 00 - Temporary Utilities

.2 Section 01 56 00 - Temporary Barriers and Enclosures

.3 Section 01 74 11 - Cleaning

1.3 INSTALLATION AND REMOVAL

.1 Provide construction facilities in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.4 HOISTING

.1 Provide, operate and maintain hoists required for moving of workers, materials and equipment and provide maintenance and use of hoists.

.2 Hoist to be operated by qualified operator.

1.5 SITE STORAGE/LOADING

.1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products and materials.

.2 Do not load or permit to load any part of Work with weight or force that will endanger Work.

.3 Contractor shall consider that existing wharf is closed. Only cells next to the hauling ramp can be used by small cars.

.4 Before storing equipment or materials on-site, the Contractor shall obtain written authorization from Harbour Authority.

1.6 ON-SITE PARKING

.1 Parking will be permitted on site if it does not disrupt performance of Work. The storage area planned for the Contractor can be used for this purpose.

.2 Provide and maintain adequate access to project site.

.3 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and repair damages resulting from Contractors' use of roads

.4 Clean runways where used by Contractor's equipment.

1.7 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 to provide their own offices as necessary. Direct location of these offices.

.4 Departmental Representative's Site office.

.1 Provide temporary office for Departmental Representative.

.2 Inside dimensions minimum 3.6 m long x 3 m wide x 2.4 m high, with floor 0.3 m above grade, complete with 4 - 50% opening windows and one lockable door.

.3 Insulate building and provide heating system to maintain 22 degrees C inside temperature at -20 degrees C outside temperature.

.4 Finish inside walls and ceiling with plywood, hardboard or wallboard and paint in selected colours. Finish floor with 19 mm thick plywood.

.5 Install electrical lighting system to provide min 750 lx using surface mounted, shielded commercial fixtures with 10 % upward light component.

.6 Equip office with 1 x 2 m table, 4 chairs, one 3-drawer filing cabinet, drawing rack, coat rack and shelf.

.7 The Contractor shall arrange and pay for the installation of 2 telephone lines, with separate numbers, and High speed Internet service. One telephone line shall have a speaker telephone and answering machine, and the other shall have an auto-answering telephone/facsimile machine.

.8 Electricity, telephone calls and faxes and Internet connection shall be paid for by Contractor. Long distance calls are paid by Departmental Representative.

.9 Contractor shall keep water cooler, toilet, electrical supply, telephone, fax, Internet connection, HVAC and lighting systems in good running order, and shall maintain office in clean condition, throughout the duration of the Work.

.10 The Contractor shall maintain the road leading to the office throughout duration of Works.

.11 The site offices shall be located within reserved area as shown on the plans. The Contractor shall provide a suitable safety barrier around the site offices to protect the buildings and personal from his operations, and shall maintain safe access to the offices throughout duration of Works.

.12 If Contractor wants to use other lots adjacent to the work site, he shall come to an agreement with the owners concerned and submit to Departmental Representative and to contracting authority a copy of this agreement. The Contractor shall also obtain Departmental Representative’s approval regarding location of the Departmental Representative’s office with respect to the work site and access.

.13 Site offices shall be established on site prior to works.

.14 Maintain worksite clean.

1.8 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 manner to cause least interference with work activities.

1.9 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.

1.10 CONSTRUCTION SIGNAGE

.1 Provide and erect project sign, within three (3) weeks of notice of acceptance of order, in a location designated by Departmental Representative.

.2 Construction sign 1.2 m x 2.4 m, of wood frame and plywood construction painted with exhibit lettering produced by a professional sign painter.

.3 Indicate on sign, name of Owner, Contractor and Subcontractor (if applicable), of design style established by Departmental Representative.

.4 No other signs or advertisements, other than warning signs, are permitted on site.

.5 Provide project identification site sign comprising foundation, framing, and one 1200 x 2400 mm signboard as detailed and as described below.

.1 Foundations: 15 MPa concrete to CSA-A23.1 minimum 200 mm x 900 mm deep.

.2 Framework and battens: SPF, pressure treated minimum 89 x 89 mm.

.3 Signboard: Medium Density Overlaid Douglas fir Plywood to CSA O121.

.4 Paint: alkyd enamel to CAN/CGSB-1.59 over exterior alkyd primer to CAN/CGSB 1.189.

.5 Fasteners: hot-dip galvanized steel nails and carriage bolts.

.6 Locate project identification sign as directed by Departmental Representative and construct as follows:

.1 Build concrete foundation, erect framework, and attach signboard to framing.

.2 Paint surfaces of signboard and framing with one coat primer and two coats enamel. Colour white on signboard face, black on other surfaces.

.3 Apply vinyl sign face overlay to painted signboard face in accordance with installation instruction supplied.

.7 Direct requests for approval to erect Contractor signboard to Departmental Representative. For consideration general appearance of signboard must conform to project identification site sign. Wording in both official languages.

.8 Signs and notices for safety and instruction in both official languages. Graphic symbols to CAN/CSA-Z321.

.9 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by Departmental Representative.

1.11 ELECTRICAL SERVICES

.1 Supply necessary electrical services on work site.

.2 Assume the cost of these electrical services, whether for lighting, heating or other uses.

.3 Assume the cots of installation and removal of these electrical services

.4 The installation of electrical services shall be abide by applicable laws and regulations

1.12 TEMPORARY AIDS TO NAVIGATION AND MARKER BUOYS

.1 Provide temporary aids to navigation and marker buoys to delineate work areas acceptable to Canadian Coast Guard and Harbour Authority.

.2 Coordinate with the Local Authorities to provide Notices to Mariners regarding navigation requirements throughout the duration of Work

1.13 CLEANING

.1 Remove construction debris, waste materials, packaging material from work site daily.

.2 Once Works is completed, remove machinery/tools and evacuate waste to leave the place in order.

.3 Clean work area progressively.

Part 2 Products

.1 Not Used.

Part 3 Execution

.1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION CONTENT

.1 Temporary Site Enclosures and Barriers

.2 Fire Routes

1.2 RELATED SECTIONS

.1 Section 01 14 00 – Work Restrictions

.2 Section 01 51 00 – Temporary Utilities

.3 Section 01 52 00 – Construction Facilities

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 GUARD RAILS AND BARRICADES

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

.2 Provide items as required by governing authorities.

1.5 FIRE ROUTES

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

1.6 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.

1.7 PROTECTION OF WORK FINISHES

.1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.

.2 Provide necessary screens, covers, and hoardings.

.3 Be responsible for damage incurred due to lack of or improper protection.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 SECTION CONTENT

.1 Product quality, availability, storage, handling, protection, and transportation

.2 Manufacturer's instructions

.3 Work execution, coordination and fastenings

.4 Existing structures

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal procedures

1.3 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 born by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

.4 If no specific date or edition is mentioned, conform to the most recent standards in force at the time of the deposit of tender.

1.4 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 Contractor responsibility, but is precaution against oversight or error. Contractor shall 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, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.5 AVAILABILITY

.1 Immediately upon notice of acceptance of offer, 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 might 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.

1.6 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 or panel materials and lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.

.7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

.8 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 nameplates.

1.7 TRANSPORTATION

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

.2 Transportation cost of products supplied by Departmental Representative will be paid for by Departmental Representative. Unload, handle and store such products.

1.8 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.

1.9 QUALITY OF WORK

.1 Ensure Quality of Work is of best quality, 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 of workers deemed incompetent or careless.

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

1.10 CO-ORDINATION

.1 Ensure co-operation of subcontractors in laying out Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.11 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.

1.12 LOCATION OF FIXTURES

.1 Consider location of mechanical and electrical items indicated as approximate.

.2 Inform Departmental Representative of conflicting installation. Install as directed.

1.13 PROTECTION OF WORK IN PROGRESS

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

1.14 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 and local users.

.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.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION CONTENT

.1 Field engineering survey services to measure and stake site

.2 Survey services to establish or validate work location (steel sheet piling wall, tie-rod, lighting, pulling boxes, etc.) and confirm inverts for Work

.3 Works preparation

1.2 RELATED SECTIONS

.1 Section 01 32 18 - Construction progress schedules – Bar (GANTT) charts

1.3 REFERENCES

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

1.4 QUALIFICATIONS OF SURVEYOR

.1 Qualified registered technician, licensed to practice in Place of Work.

1.5 SURVEY REFERENCE POINTS

.1 Existing base horizontal and vertical control points are designated on drawings.

.2 The benchmark can be described as follows:

.1 Reference mark "BM TER6-1984" (64°23’41’’West, 48°24’57’’North) of the Canadian Hydrographic Service is a plug horizontally anchored in the concrete wall of an old foundation. The plug is on the East side of the foundation at 5.9m of the South-West corner, near harbour entrance. The elevation is 6.607 meters above Chart Datum.

.3 Detailed descriptions of reference marks are available at following Internet site:

http://www.meds-sdmm.dfo-mpo.gc.ca/meds/prog_nat/benchmark/public/station_f.asp? T1=2840

.4 All elevation indicated on plans refer to chart datum.

.5 Tide range is generally 1.2m and higher high water of level tide reaches approximately +1.7 m, but the Contractors should consult tide tables published by the Department of Fisheries and Oceans in order to ascertain the effect of tides on the work. Also consider waves and wind that raise water level near structures.

.6 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.

.7 Make no changes or relocations without prior written notice to Departmental Representative.

.8 Report to Departmental Representative when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

.9 Require surveyor to replace control points in accordance with original survey control.

1.6 SURVEY REQUIREMENTS

.1 Establish permanent benchmarks on site, referenced to established benchmarks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.

.2 Establish lines and levels, locate and lay out, by instrumentation.

.3 Mark site prior to Works.

.4 The Contractor shall take on the entire responsibility for the marking out of the work and the complete execution in accordance with the location, the lines and the levels indicated.

.5 Provide the necessary material for the marking out and the implantation.

.6 Provide the required material such as rules and gauges to ease the work of the Departmental Representative concerning the inspection of the works.

1.7 EXISTING SERVICES

.1 Before commencing work, establish location and extent of service lines in area of Work and notify Departmental Representative of findings.

.2 Remove abandoned service lines. Cap or otherwise seal lines at cut-off points as directed by Departmental Representative

1.8 RECORDS

.1 Maintain a complete, accurate log of control and survey work as it progresses.

.2 On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.

.3 Record locations of maintained, re-routed and abandoned service lines.

1.9 SUBMITTALS

.1 Submit signed certificate certifying and noting elevations and locations of completed Work that conform and do not conform with Contract Documents.

1.10 SUBSURFACE CONDITIONS

.1 Promptly notify Departmental Representative in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.

.2 After prompt investigation, should Departmental Representative determine that conditions do differ materially; instructions will be issued for changes in Work as provided in Changes and Change Orders.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Cleaning as work progresses

.2 Final cleaning

1.2 RELATED SECTIONS

.1 Section 01 74 21 - Construction/demolition Waste Management

.2 Section 01 77 00 - Closeout Procedures

1.3 WORK SITE CLEANLINESS

.1 Maintain work site in tidy condition, free from accumulation of waste products and debris, including that caused by Owner 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 Conduct work site cleaning and disposal operations to comply with local ordinances and Clean Air Act.

.4 Prevent accumulation of hazardous waste.

.5 Keep work site and public properties clean and free of debris and waste.

.6 Keep work site access road free of ice and snow. Place snow only at indicated areas or evacuate out of work site as indicated.

.7 Clean up dirt from passage of trucks and equipment to the satisfaction of municipal authorities and the Departmental Representative, as work progresses.

.8 Make arrangements to obtain all necessary licences from authorities for waste disposal.

.9 Provide on-site containers for collection of waste materials and debris.

.10 Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.11 Dispose of waste materials and debris at designated dumping areas by the Department Representative.

.12 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

1.4 FINAL CLEANING

.1 When work is substantially performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining work.

.2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

.3 Prior to final review remove surplus products, tools, construction machinery and equipment.

.4 Remove waste products and debris including that caused by Owner or other Contractors.

.5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.

.6 Make arrangements to obtain all necessary licences from authorities for waste disposal.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 01 35 43 – Environmental Procedures

.3 Section 01 74 11 – Cleaning

.4 Section 02 41 16 – Structure Demolition

.5 Section 02 81 01 – Hazardous materials

.6 Section 35 31 23 – Rubble Mound Breakwater

1.2 DEFINITIONS

.1 Recycling: process of sorting, cleaning, 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.

.2 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.

.3 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.

.4 Source Separation: acts of keeping different types of waste materials separate beginning from first time they became waste.

1.3 SUBMITTALS

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

.2 The Contractor will have to provide a weekly report on its construction/demolition waste disposal. This report will include, if required, the results of the physicochemical analyses carried out on materials coming from the work site or any other relevant document.

.3 Submit before final payment summary of waste materials salvaged for reuse, recycling or disposal.

.1 Failures to submit could result in hold back of final payment.

.2 Provide receipts, scale tickets, waybills, and show quantities and types of materials reused, recycled or disposed of.

.3 For each material reused, sold or recycled from project, include amount in tonnes and the destination.

.4 For each material land filled or incinerated from project, include amount in tonnes of material and identity of landfill, incinerator or transfer station.

1.4 STORAGE, HANDLING AND PROTECTION

.1 Store, materials to be reused, recycled and salvaged in locations as directed by Departmental Representative.

.2 Unless specified otherwise, materials for removal become Contractor's property. Contractor is responsible for disposing of these materials and choosing authorized landfill site.

.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 Protect structural components not removed for demolition from movement or damage.

.6 Support affected structures. If safety of structures is endangered, cease operations and immediately notify Departmental Representative.

.7 Protect mechanical and electrical from damage and blockage.

.8 Separate and store materials produced during dismantling of structures in designated areas.

.9 Prevent contamination of materials to be salvaged and recycled in accordance with requirements for acceptance by designated facilities.

.1 On-site source separation is recommended.

.2 Remove co-mingled materials to off-site processing facility for separation.

.3 Provide waybills for separated materials.

.10 Store treated wood on site in a temporary containment area set up for this purpose to prevent streaming water from reaching aquatic environment.

.11 Transport materials whose level of contamination would be equal or higher than the generic C criterion of the MDDELCC Soil Protection and Rehabilitation of Contaminated Sites Policy, either in a closed means of containment or in a dump vehicle equipped with a waterproof tarpaulin completely covering the top of the body and the load. (Art. 18, *Transportation of dangerous substances Regulation*).

1.5 DISPOSAL OF WASTES

.1 Recover, sort and separate waste generated by demolition into categories in preparation for transfer to various licensed sites. Contractor shall recover (reuse and/or recycle) non contaminated materials before disposal:

.1 Rock and other granular materials to be removed from existing structures will be recovered and reused for the most part as quarry-run material for the construction of new structures, if they meet the specification requirements.

.2 Metals must be removed from wood recovered from demolition, and wood residues from construction must be managed according to the best practices and standards in effect. Leachate waters from temporarily stored wood that has been treated or is being treated must be recovered and disposed of at an authorized site.

.3 Excavated material from marine sediments and superficial deposits and rock may be used as quarry-run at the lower section of the new breakwater.

.2 Manage construction or demolition debris and waste that cannot be reclaimed on land in conformance with requirements of the Quebec Department of Sustainable Development, the Environment and Parks (according to the "Soil Protection and Rehabilitation of Contaminated Sites Policy" or "Dry Materials Management"). Do not incorporate any demolition materials into work other than those accepted. Contractor is responsible for disposing of these materials and choosing authorized landfill site.

.3 Do not bury rubbish or waste materials.

.4 Do not dispose of waste, volatile materials, mineral spirits, oil or paint thinner into waterways, storm, or sanitary sewers.

.5 Remove materials from deconstruction as deconstruction/disassembly Work progresses.

.6 Evacuate waste materials out of site along with work progress.

.7 Prepare project summary to verify destination and quantities on a material-by-material basis as identified.

1.6 SCHEDULING

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 APPLICATION

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

.2 Soils characterization of work site will be done prior and after works. Contamination caused by Contractor operations shall be rectified, without expense to Departmental Representative.

3.2 CLEANING

.1 Remove tools and waste materials on completion of Work, and leave work area in clean and orderly condition.

.2 Clean-up work area as work progress.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 01 78 00 – Closeout Submitals

1.2 INSPECTION AND DECLARATION

.1 Contractor's Inspection: Contractor and all Subcontractors shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.1 Notify Departmental Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.

.2 Request Departmental Representative's Inspection.

.2 Departmental Representative's Inspection: Departmental Representative and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor shall correct Work accordingly.

.3 Completion: submit written certificate that following have been performed:

.1 Work has been completed and inspected for compliance with Contract Documents.

.2 Defects have been corrected and deficiencies have been completed.

.3 Equipment and systems have been tested, adjusted, balanced and are fully operational.

.4 Certificates required by Utility companies have been submitted.

.5 Operation of systems has been demonstrated to Owner's personnel.

.6 Work is complete and ready for final inspection.

.4 Final Inspection:

.1 When items noted above are completed, request final inspection of Work by Departmental Representative and Contractor.

.2 If Work is deemed incomplete by Departmental Representative, complete outstanding items and request reinspection.

.5 Declaration of Substantial Performance: Departmental Representative considers deficiencies and defects have been corrected and it appears requirements of Contract have been substantially performed, make application for certificate of Substantial Performance.

.6 Commencement of Lien and Warranty Periods: date of Departmental Representative's acceptance of submitted declaration of Substantial Performance shall be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.

.7 Certificate of Final Performance:

.1 When Departmental Representative considers final deficiencies and defects have been corrected and it appears requirements of Contract have been totally performed, make application for final payment.

.2 If Work is deemed incomplete by Departmental Representative, complete outstanding items and request reinspection.

1.3 FINAL CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 45 00 – Quality Control

.2 Section 01 77 00 – Closeout Procedures

1.2 SUBMITTALS

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

.2 Prepare instructions and data using personnel experienced in maintenance and operation of described products.

.3 Copy will be returned with Departmental Representative comments after final inspection.

.4 Revise content of documents as required prior to final submittal.

.5 Two weeks prior to Substantial Performance of the Work, submit to Departmental Representative, two final copies of operating and maintenance manuals in French.

.6 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.

.7 Furnish evidence, if requested, for type, source and quality of products provided.

.8 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

.9 Pay costs of transportation.

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 pocket.

.3 When multiple binders are used, correlates data into related consistent groupings. 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 flyleaf 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. Bind in with text; fold larger drawings to size of text pages.

.9 Provide 1:1 scaled CAD files in dwg format on CD.

1.4 CONTENTS - EACH VOLUME

.1 Table of Contents: provide title of project;

.1 Date of submission;

.2 Names, addresses, and telephone numbers of 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. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

1.5 AS-BUILTS AND SAMPLES

.1 Maintain, in addition to requirements in General Conditions, at site for Departmental Representative, one record copy of:

.1 Contract Drawings.

.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. Provide files, racks, and secure storage.

.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 Departmental Representative.

1.6 RECORDING ACTUAL SITE CONDITIONS

.1 Record information on set of drawings and in copy of Project Manual provided by Departmental Representative.

.2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information. On CAD drawings, ensure that information is located in clearly named "as built" layers.

.3 Record information concurrently while construction progress. Do not conceal Work until required information is recorded.

.4 Contract Drawings and shop drawings: mark each item to record actual construction, including:

- .1 Measured horizontal and vertical locations of waling, tie-rods, anchor wall, underground utilities and appurtenances, referenced to permanent surface improvements.
- .2 Field changes of dimension and detail.
- .3 Changes made by change orders.
- .4 Details not on original Contract Drawings.
- .5 References to related shop drawings and modifications.

.5 Specifications: 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.

.6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

1.7 FINAL SURVEY

.1 Submit final site survey certificate in accordance with Section 01 71 00 - Examination and Preparation, certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.

1.8 EQUIPMENT AND SYSTEMS

.1 For each item of equipment and each system, include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.

.3 Include installed colour coded wiring diagrams.

.4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

.5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.6 Include manufacturer's printed operation and maintenance instructions.

.7 Include sequence of operation by controls manufacturer.

.8 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.9 Provide installed control diagrams by controls manufacturer.

.10 Include test and balancing reports as specified in Section 01 45 00 – Quality Control.

.11 Additional requirements: as specified in individual specification sections.

1.9 MATERIALS AND FINISHES

.1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations

.2 Supply instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.3 Moisture-Protection and Weather-Exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.4 Additional Requirements: as specified in individual specifications sections.

1.10 MAINTENANCE MATERIALS

.1 Spare Parts:

.1 Provide spare parts, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Deliver, place and store to location as directed;.

.4 Receive and catalogue items.

.1 Submit inventory listing to Departmental Representative.

.2 Include approved listings in Maintenance Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

.2 Extra Stock Materials:

.1 Provide maintenance and extra materials, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Deliver, place and store to location as directed.

.4 Receive and catalogue items.

.1 Submit inventory listing to Departmental Representative.

.2 Include approved listings in Maintenance Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

.3 Special Tools:

.1 Provide special tools, in quantities specified in individual specification section.

.2 Provide items with tags identifying their associated function and equipment.

.3 Deliver, place and store to location as directed.

.4 Receive and catalogue items.

.1 Submit inventory listing to Departmental Representative.

.2 Include approved listings in Maintenance Manual.

1.11 STORAGE, HANDLING AND PROTECTION

.1 Store spare parts, maintenance materials and special tools in manner to prevent damages or deterioration.

.2 Store components in original and undamaged condition with manufacturer's seal and labels intact.

.3 Store components subject to damage from weather in weatherproof enclosures.

.4 Store paints and freezable materials in a heated and ventilated room.

.5 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.

1.12 WARRANTIES AND BONDS

.1 Assemble approved information in binder and submit upon acceptance of work. 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 Except for items put into use with Departmental Representative's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.

.5 Verify that documents are in proper form, contain full information, and are notarized.

.6 Co-execute submittals when required.

.7 Retain warranties and bonds until time specified for submittal.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Methods and procedures for total or partial demolition of structures.

1.2 RELATED SECTIONS

.1 Section 01 11 11 – Description of work

.2 Section 01 33 00 - Submittal Procedures

.3 Section 01 35 29 – Health and safety requirements

.4 Section 01 35 43 – Environmental procedures

.5 Section 01 56 00 - Temporary Barriers and Enclosures

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

1.3 REFERENCES

.1 Canadian Environmental Protection Act (CEPA)

.1 CCME PN 1327, Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products

.2 Canadian Standards Association (CSA International).

.1 CSA S350-M, Code of Practice for Safety in Demolition of Structures.

.3 Department of Justice Canada (Jus).

.1 Canadian Environmental Assessment Act (CEAA).

.2 Canadian Environmental Protection Act (CEPA).

.1 SOR/2003-2, On-Road Vehicle and Engine Emission Regulations.

.2 SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations.

.3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

.4 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S660, Standard for Nonmetallic Underground Piping for Flammable and Combustible Liquids.

.2 ULC/ORD-C58.15, Overfill Protection Devices for Flammable Liquid Storage Tanks.

.3 ULC/ORD-C58.19, Spill Containment Devices for Underground Flammable Liquid Storage Tanks.

.5 U.S. Environmental Protection Agency (EPA).

.1 EPA CFR 86.098-10, Emission standards for 1998 and later model year Otto-cycle heavy-duty engines and vehicles.

.2 EPA CFR 86.098-11, Emission standards for 1998 and later model year diesel heavy-duty engines and vehicles.

.3 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.4 DEFINITIONS

.1 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, may include but not limited to: poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health or well being or environment if handled improperly.

1.5 SUBMITTALS

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

.2 The Contractor is responsible for fulfilment of reporting requirements.

.3 Submit if requested by Departmental Representative, copies of certified weigh bills, bills of lading or receipts from authorized disposal sites and reuse and recycling facilities for material removed from site.

.1 Written authorization from Departmental Representative is required to deviate from receiving organizations.

.4 When required by authorities having jurisdiction, submit for approval drawings, diagrams or details showing sequence of demolition work and supporting structures and underpinning.

.5 Submit drawings stamped and signed by qualified professional engineer registered or licensed in Province of Quebec, Canada.

1.6 QUALITY ASSURANCE

.1 Regulatory Requirements: Ensure Work is performed in compliance with CEPA, CEAA, TDGA, and applicable Provincial/Territorial and Municipal regulations.

.2 Meetings:

.1 Prior to start of Work arrange for site visit with Departmental Representative to examine existing site conditions adjacent to demolition work.

.2 Hold project meetings as requested by Departmental Representative.

.3 Ensure all key personnel attend.

.4 Departmental Representative will provide written notification of change to meeting schedule established upon contract award.

1.7 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 Divert excess materials from landfill to site approved by Departmental Representative.

1.8 ENVIRONMENTAL PROTECTION

.1 Ensure Work is done in accordance with Section 01 35 43 - Environmental Procedures.

.2 Ensure that demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.

.3 Fires and burning of waste or materials is not permitted on site.

.4 Do not dispose of waste or volatile materials including but not limited to: mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers.

.1 Ensure proper disposal procedures are maintained throughout project.

.5 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers, or onto adjacent properties.

.6 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with authorities having jurisdiction and as directed by Departmental Representative.

.7 Cover or wet down dry materials and waste to prevent blowing dust and debris. If required by Departmental Representative, control dust on all temporary roads.

1.9 EXISTING CONDITIONS

.1 The Contractor shall take the necessary steps to become thoroughly familiar with all aspects of the work site environment.

.2 The Contractor shall take into account in its bid and during work that steel sheet pile was not protected by a cathodic protection system and the degree of corrosion varies from section of wharf to another. In general, significant corrosion was observed at the tidal zone and perforations were observed in some places. Specifically, wharf # 401-section spur wharf and # 403 south sections have a generalized perforation.

.3 Contractor shall consider the state of existing stones during demolition and recovery Works. Work method shall be adapted in order to reach the highest rate of recovery as possible. If required by Departmental Representative, the initial Work method of Contractor would be modified to increase the recovery rate.

.4 The Contractor will be responsible for the wintering and/or installation of all harbour’s floating docs for seasons 2015-2016, 2016-2017 and 2017-2018 (continuity in service delivery and upstream basin).

.5 The results of the most recent bathymetric survey are included in drawings. The information is provided for tender only. Information can differ form site conditions during Work.

.6 A geotechnical survey was conducted in two (2) harbour sectors to clarify data from previous survey from the time of sheet pile wharves.

.7 Contractor shall provide Departmental Representative with Work method about junction between existing wharves sections to preserve and new wharf sections.

.8 Contractor shall proceed by sections for demolition and reconstruction of stone protection and breakwater; it will not be allowed to carry out the complete demolition prior to new structures reconstruction in order to protect interior of the harbour.

.9 Should material resembling hazardous substance be encountered in course of demolition, stop work, take preventative measures, and notify Departmental Representative immediately. Do not proceed until written instructions have been received.

.10 If the demolition works require the installation of temporary supporting structures to protect the existing hauling ramp, the workshop drawings must carry the seal and signature of a recognized qualified engineer or holding a license enabling him to exert in Canada, in the Province de Québec.

.11 Structures to be demolished to be based on their condition on date that tender is accepted.

.1 Remove, protect and store salvaged items as directed by Departmental Representative.

.12 The Contractor shall conduct research on historical temperature, wave and ice conditions and assess possible difficulties. There shall be no additional payment for lost time as a result of weather conditions.

.13 Weather conditions can be difficult (wind, cold, etc.). The work site may be subject to significant agitation due to waves.

1.10 SCHEDULING

.1 Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion.

.1 In event of unforeseen delay notify Departmental Representative in writing.

Part 2 Products

2.1 EQUIPMENT

.1 Equipment and heavy machinery to:

.1 On-road vehicles to meet applicable emission requirements as prescribed in CEPA-SOR/2003-2, On-Road Vehicle and Engine Emission Regulations.

.2 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

Part 3 Execution

3.1 PROTECTION

.1 Prevent movement, settlement or damage of adjacent structures to prevent damage. Protect existing steel sheet pilling to preserve near dolosse protection

.1 Repair damage caused by demolition work as directed by Departmental Representative.

.2 Support affected structures and, if safety of structure being demolished or adjacent structures appears to be endangered, take preventative measures, stop Work and immediately notify Departmental Representative.

3.2 PREPARATION

.1 Do Work in accordance with Section 01 35 29 - Health and Safety Requirements.

.2 The following components, recovered from demolition or modification work, shall be submitted to Departmental Representative:

.1 Lightening posts

.2 Rubber fender not reuse in new structures

.3 Information concerning the existing structures given on drawings is partial and had to be supplemented on the site.

.4 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 and walkways, according to requirements of authorities having jurisdiction. Inspect control measures, ensure maintenance and repair as needed during demolition work.

.2 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal after completion of demolition work.

.5 Protection of in-place conditions:

.1 Work in accordance with Section 01 35 43 - Environmental Procedures.

.2 Prevent movement, settlement or damage of adjacent structures, services, adjacent grades and parts of existing structures to remain.

.1 Provide bracing and shoring and underpinning as required.

.2 Repair damage caused by demolition as directed by Departmental Representative.

.3 Support affected structure. If safety of structure being demolished appears to be endangered, take preventative measures, stop Work and immediately notify Departmental Representative.

.6 Surface Preparation:

.1 Disconnect and re-route electrical and telephone service lines entering buildings to be demolished.

.1 Post warning signs on electrical lines and equipment which must remain energized to serve other properties during period of demolition.

.2 Disconnect and cap designated mechanical services.

.1 Sewer and water lines: remove as directed by Departmental Representative.

.2 Other underground services: remove and dispose of as directed by Departmental Representative.

.3 Do not disrupt active or energized utilities designated to remain undisturbed.

3.3 SAFETY CODE

.1 Do demolition work in accordance with Section 01 56 00 - Temporary Barriers and Enclosures, 01 35 29 Safety and Health and also codes regarding demolition work.

3.4 REMOVAL OF HAZARDOUS WASTES

.1 Remove contaminated or dangerous materials as defined by authorities having jurisdiction, relating to environmental protection, from site and dispose of in safe manner to minimize danger at site or during disposal in accordance with section 01 74 21 - Construction/Demolition Waste Management and Disposal.

3.5 DEMOLITION AND EXCAVATION

.1 No compensation will be approved for demolition work outside boundaries of demolition indicated on plans or determined by Departmental Representative.

.2 Information concerning the existing structures is drawn from « As-built » plans as well as from statements carried out on the le site. The tender must reflect these conditions. In the 48 hours following the discovery of a divergence at the time of the realization of work, Contractor shall inform the Departmental Representative of the situation.

.3 Remove demolition material or excavate at elevations on plan.

.4 Execute demolition work to permit construction.

.5 Excavate the marine sediments, overburden and rock in place to create the foundation for new wharves. Reuse the excavated material as stone, run material for new breakwater.

.6 When demolition and excavation works are done, ask Departmental Representative for verification of rises and dimensions.

.7 Do not allow pieces of wood to drift or release demolition material in the water. The Contractor shall immediately recover any debris released into water, at his own expense, and will be held responsible for any damage caused by floating or released material.

.8 Identify sources for recycling granular material.

.1 To get more information about recycling, communicate with provincial/local granular material supplier.

.9 Remove existing equipment, services, and obstacles where required for refinishing or making good of existing surfaces, and replace as work progresses.

.10 At the end of each day work, leave Work in safe and stable condition.

.11 Carry out demolition work as so to minimize dusting. Keep materials wet as directed by Departmental Representative.

.12 Only dispose of waste material within the specified alternative disposal option as directed by Departmental Representative.

.1 Additional disposal options for waste diversion to be provided on-site by Departmental Representative prior to disposal.

.13 Do not dispose materials in landfill or waste stream destined for landfill.

.14 Unless otherwise specified, remove and dispose of demolition materials in accordance with competent authority requirements.

.15 Use natural lighting to do work where possible. Shut off lighting at the end of each day, except for those required for security purposes.

.16 Take account of the hydrostatic and hydrodynamic uplifts during demolition and construction work, in particular, in the sector of the dolosse protection.

3.6 POST-DEMOLITION SURVEY

.1 After demolishing wharf and before installing the new structures, the Contractor shall conduct a bathymetric and/or land survey to map the natural ground profile within the limits of the new structures.

.2 The Contractor shall not begin construction of the stone protection and breakwater until the Departmental Representative has reviewed the survey and given permission.

3.7 MATERIALS

.1 All materials from demolition that cannot be reused or those who will not be returned to Departmental Representative will become the property of the Contractor and shall be removed promptly according to Work progress.

.2 Do all sorting of materials directly on site. Unless specified, no other method will be accepted.

.3 The Contractor shall refer to Section 01 74 21 – Construction/Demolition Waste Management for the procedures for handling and storing demolition materials on-site.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

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

1.2 REFERENCES

.1 Canadian Environmental Protection Act, (CEPA)

.1 Export and Import of Hazardous Waste Regulations

.2 Department of Justice Canada (Jus)

.1 Transportation of Dangerous Goods Act, (TDG Act), (c. 34).

.2 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286).

.3 Health Canada / Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.4 National Research Council Canada Institute for Research in Construction (NRC-IRC)

.1 National Fire Code of Canada

1.3 DEFINITIONS

.1 Dangerous Goods: product, substance, or organism that is specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.

.2 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 environment or adversely affect health of persons, animals, or plant life when released into the environment.

.3 Hazardous Waste: any hazardous material that is no longer used for its original purpose and that is intended for recycling, treatment or disposal.

.4 Workplace Hazardous Materials Information System (WHMIS): a Canada-wide system designed to give employers and workers information about hazardous materials used in workplace. Under WHMIS, information on hazardous materials is provided on container labels, material safety data sheets (MSDS), and worker education programs. WHMIS is put into effect by combination of federal and provincial laws.

1.4 SUBMITTALS

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

.2 Submit to Departmental Representative current Material Safety Data Sheet (MSDS) for each hazardous material required prior to bringing hazardous material on site.

.3 Submit manufacturer's instructions, printed product literature and data sheets for hazardous materials and include product characteristics, performance criteria, physical size, finish and limitations.

.4 Submit two copies of WHMIS MSDS in accordance with Section 01 35 29 - Health and Safety Requirements and Section 01 35 43 - Environmental Procedures to Departmental Representative for each hazardous material required prior to bringing hazardous material on site.

.5 Submit hazardous materials management plan to Departmental Representative that identifies hazardous materials, their use, their location, personal protective equipment requirements, and disposal arrangements.

1.5 TRANSPORT, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

.2 Transport hazardous materials and wastes in accordance with Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.

.1 When exporting hazardous waste to another country, ensure compliance with Export and Import of Hazardous Waste and Hazardous Recyclable Materials Regulations.

.3 Storage and Handling Requirements:

.1 Co-ordinate storage of hazardous materials with Departmental Representative and abide by internal requirements for labelling and storage of materials and wastes.

.2 Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.

.3 Store and handle flammable and combustible materials in accordance with National Fire Code of Canada requirements.

.4 Keep no more than 45 litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use.

.1 Store flammable and combustible liquids in approved safety cans bearing the Underwriters' Laboratory of Canada or Factory Mutual seal of approval.

.2 Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires the written approval of the Departmental Representative.

.5 Transfer of flammable and combustible liquids is prohibited within buildings.

.6 Transfer flammable and combustible liquids away from open flames or heat-producing devices.

.7 Solvents or cleaning agents must be non-flammable or have flash point above 38 degrees C.

.8 Store flammable and combustible waste liquids for disposal in approved containers located in safe, ventilated area. Keep quantities to minimum.

.9 Observe smoking regulations, smoking is prohibited in areas where hazardous materials are stored, used, or handled.

.10 Storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 litres for liquids:

.1 Store hazardous materials and wastes in closed and sealed containers.

.2 Label containers of hazardous materials and wastes in accordance with WHMIS.

.3 Store hazardous materials and wastes in containers compatible with that material or waste.

.4 Segregate incompatible materials and wastes.

.5 Ensure that different hazardous materials or hazardous wastes are stored in separate containers.

.6 Store hazardous materials and wastes in secure storage area with controlled access.

.7 Maintain clear egress from storage area.

.8 Store hazardous materials and wastes in location that will prevent them from spilling into environment.

.9 Have appropriate emergency spill response equipment available near storage area, including personal protective equipment.

.10 Maintain inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.

.4 Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.

.5 Report spills or accidents immediately to Departmental Representative. Submit a written spill report to Departmental Representative within 24 hours of incident.

.6 When hazardous waste is generated on site:

.1 Co-ordinate transportation and disposal with Departmental Representative.

.2 Comply with applicable federal, provincial and municipal laws and regulations for generators of hazardous waste.

.3 Use licensed carrier authorized by provincial authorities to accept subject material.

.4 Before shipping material obtain written notice from intended hazardous waste treatment or disposal facility it will accept material and it is licensed to accept this material.

.5 Label containers with legible, visible safety marks as prescribed by federal and provincial regulations.

.6 Only trained personnel handle, offer for transport or transport dangerous goods.

.7 Provide photocopy of shipping documents and waste manifests to Departmental Representative.

.8 Track receipt of completed manifest from consignee after shipping dangerous goods. Provide photocopy of completed manifest to Departmental Representative.

.9 Report discharge, emission, or escape of hazardous materials immediately to Departmental Representative and appropriate provincial authority. Take reasonable measures to control release.

Part 2 Products

2.1 MATERIALS

.1 Only bring on site quantity of hazardous materials required to perform work.

.2 Maintain MSDSs in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.

Part 3 Execution

3.1 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

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

.1 Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.

.2 Recycle hazardous wastes for which there is approved, cost effective recycling process available.

.3 Send hazardous wastes to authorized hazardous waste disposal or treatment facilities.

.4 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.

.5 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.

.6 Dispose of hazardous wastes in timely fashion in accordance with applicable provincial regulations.

.7 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.

.8 Identify and evaluate recycling and reclamation options as alternatives to land disposal, such as:

.1 Hazardous wastes recycled in manner constituting disposal.

.2 Hazardous waste burned for energy recovery.

.3 Lead-acid battery recycling.

.4 Hazardous wastes with economically recoverable precious metals.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 03 20 00 – Concrete Reinforcing

.2 Section 03 30 00 - Cast-in-place concrete

.3 Section 03 41 00 – Precast Structural Concrete

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

- .1 CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .2 CSA-O86S1, Supplement No. 1 to CAN/CSA-O86-01, Engineering Design in Wood
- .3 CSA O121, Douglas fir Plywood
- .4 CSA O151, Canadian Softwood Plywood
- .5 CSA O153, Poplar Plywood
- .6 CSA O437, Standards for OSB and Waferboard
- .7 CSA S269.1, Falsework for Construction Purposes
- .8 CAN/CSA-S269.3, Concrete Formwork, National Standard of Canada

.2 Underwriters' Laboratories of Canada (ULC)

- .1 CAN/ULC-S701, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

1.3 SUBMITTALS

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

.2 Submit shop drawings for formwork and falsework.

- .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Québec, Canada.

.3 Submit to Departmental Representative current Material Safety Data Sheet (MSDS) required in accordance with section 02 81 01 – Hazardous Materials

.4 Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special architectural exposed finishes, ties, liners, and locations of temporary embedded parts.

.5 Comply with CSA S269.1, for falsework drawings

.6 Comply with CAN/CSA-S269.3 for formwork drawings.

.7 Indicate formwork design data: permissible rate of concrete placement, and temperature of concrete, in forms.

.8 Indicate sequence of erection and removal of formwork/falsework as directed by Departmental Representative.

.9 When slip forming or flying forms are used, submit details of equipment and procedures for review by Departmental Representative.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Store and manage hazardous materials in accordance with Section 02 81 01 – Hazardous Materials.

.2 Waste Management and Disposal:

.1 Separate waste materials for reuse and recycling in accordance with Section 01 47 21 - Construction/Demolition Waste Management and Disposal.

.2 Place materials defined as hazardous or toxic in designated containers.

.3 Divert wood materials from landfill to a recycling, reuse or composting facility as approved by Departmental Representative.

.4 Divert plastic materials from landfill to a recycling, reuse, composting facility as approved by Departmental Representative.

.5 Ensure empty containers are sealed and stored in a safe place and out of reach of children for future disposal.

Part 2 Products

2.1 MATERIALS

.1 Formwork materials:

.1 For concrete without special architectural features, use wood and wood product formwork materials to CSA-O121, CAN/CSA-O86.1, CSA O437 Series or CSA-O153.

.2 The formwork must be in conformity with standard CAN3-A23.1-M77. Respect the maximum tolerances for the finished concrete works as mentioned in standard 347 of ACI « Recommended Practice for Concrete Formwork ».

.2 Form ties:

.1 For concrete not designated 'Architectural', use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm of diameter in concrete surface.

.2 For Architectural concrete, use snap ties complete with plastic cones and light grey concrete plugs.

.3 Form liner:

.1 Plywood: Douglas fir to CSA O121, Canadian Softwood Plywood to CSA O151 or Poplar to CSA O153.

.2 Waferboard: to CAN3-O188.0.

.4 Form release agent: non-toxic, biodegradable and low VOC.

.5 Form stripping agent: colourless mineral oil, non-toxic, biodegradable, low VOC, free of kerosene, with viscosity between 70 and 110 Saybolt Universal (15 to 24 mm^2/s) at 40®C, flashpoint minimum 150®C, open cup.

.6 Falsework materials: to CSA-S269.1.

.7 Sealant: use appropriate material.

Part 3 Execution

3.1 FABRICATION AND ERECTION

.1 Verify lines, levels and centres before proceeding with formwork and ensure dimensions agree with drawings.

.2 Obtain Departmental Representative's approval for use of earth forms framing openings not indicated on drawings.

.3 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.

.4 Do not place concrete slabs or footings on frozen ground.

.5 Fabricate and erect falsework in accordance with CSA S269.1.

.6 Provide site drainage to prevent washout of soil supporting mud sills and shores.

.7 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA-A23.1/A23.2.

.8 Use 25 mm chamfer strips on external corners and/or 25mm fillets at interior corners, joints, unless specified otherwise.

.9 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.

.10 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections. Assure that all anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.

.11 Line forms for following surfaces:

.1 Outer face of girders, beams and vertical edge of slab.

.2 Soffit of girders and underside of bridge decks if exposed.

.3 Exposed faces of abutments, wingwalls, piers and pylons: do not stagger joints of form lining material and align joints to obtain uniform pattern.

.4 Secure lining taut to formwork to prevent folds.

.5 Pull down lining over edges of formwork panels.

.6 Ensure lining is new and not reused material.

.7 Ensure lining is dry and free of oil when concrete is poured.

.8 Application of form release agents on formwork surface is prohibited where drainage lining is used.

.9 If concrete surfaces require cleaning after form removal, use only pressurized water stream so as not to alter concrete's smooth finish.

.10 Cost of textile lining is included in price of concrete for corresponding portion of Work.

.12 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.

.13 When slip forming and flying forms are used, submit details as indicated in Section 01 33 00 – Submittal Procedures

.14 When forms do not seem satisfactory, stop work until defects are corrected.

3.2 REMOVAL AND RESHORING

.1 Leave formwork in place for following minimum periods of time after placing concrete.

.1 3 days for slabs, blocks and other structural members.

.2 Provide necessary reshoring of members where early removal of forms may be required or where members may be subjected to additional loads during construction as required.

.3 Space reshoring in each principal direction at not more than 3 000 mm apart.

.4 Reuse formwork and falsework subject to requirements of CSA-A23.1/A23.2.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 03 10 00 – Concrete forming and accessories

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

.3 Section 03 41 00 – Precast Structural Concrete

1.2 REFERENCES

.1 American Concrete Institute (ACI)

.1 ACI 315R, Manual of Engineering and Placing Drawings for Reinforced Concrete Structure

.2 American National Standards Institute/American Concrete Institute (ANSI/ACI)

.1 ANSI/ACI 315, Details and Detailing of Concrete Reinforcement

.3 American Society for Testing and Materials (ASTM)

.1 ASTM A 775/A 775M, Specification for Epoxy-Coated Reinforcing Steel Bars

.4 Canadian Standards Association (CSA)

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

.2 CAN3-A23.3, Design of Concrete Structures for Buildings

.3 CAN/CSA-G30.18-M, Billet-Steel Bars for Concrete Reinforcement

.4 CAN/CSA-G40.20/G40.21, Structural Quality Steels

.5 CAN/CSA-G164-M, Hot Dip Galvanizing of Irregularly Shaped Articles

.6 CAN/CSA-S6, Canadian Highway Bridge Design Code

.7 CAN/CSA W186-M, Welding of Reinforcing Bars in Reinforced Concrete Construction

.5 Reinforcing Steel Institute of Canada (RSIC)

.1 RSIC-Reinforcing Steel, Manual of Standard Practice.

1.3 SHOP DRAWINGS

.1 Submit shop drawings, including placing of reinforcement in accordance with Section 01 33 00 – Submittal Procedures.

.2 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice.

.3 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Québec.

.1 Indicate placing of reinforcement and:

.1 Bar bending details.

.2 Lists.

.3 Quantities of reinforcement.

.4 Sizes, spacing, locations of reinforcement and mechanical splices if approved by Departmental Representative, with identifying code marks to permit correct placement without reference to structural drawings.

.5 Indicate sizes, spacing and locations of chairs, spacers and hangers.

.2 Detail lap lengths and bar development lengths to CAN/CSA-A23.3, unless otherwise indicated.

.1 Provide tension lap splices unless otherwise indicated.

.4 When Chromate solution is used as replacement for galvanizing non-prestressed reinforcement, provide product description for review by Departmental Representative prior to its use.

1.4 QUALITY ASSURANCE

.1 Submit in accordance with Section 01 45 00 - Quality Control and as described in PART 2 - SOURCE QUALITY CONTROL.

.1 Mill Test Report: upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel, minimum 4 weeks prior to beginning reinforcing work.

.2 Upon request 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 Section 01 61 00 - Common Product Requirements and 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 a clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

1.6 WASTE MANAGEMENT AND DISPOSAL

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

Part 2 Products

2.1 MATERIALS

.1 Substitute different size bars only if permitted in writing by Departmental Representative.

.2 Reinforcing steel: billet steel, grade 400, deformed bars to CSA-G30.18, unless indicated otherwise.

.3 Reinforcing steel: weldable low alloy steel deformed bars to CSA-G30.18.

.4 Cold-drawn annealed steel wire ties: to CSA-G30

.5 Deformed steel wire for concrete reinforcement: to ASTM A82/A82M.

.6 Welded steel wire fabric: to ASTM A185/A185M.

.1 Provide in flat sheets only.

.7 Welded deformed steel wire fabric: to ASTM A82/A82M.

.1 Provide in flat sheets only.

.8 Chairs, bolsters, bar supports, spacers: to CSA-A23.1/A23.2.

.9 Plain round bars: to CSA-G40.20/G40.21.

2.2 FABRICATION

.1 Fabricate reinforcing steel in accordance with CAN/CSA-G30.18 and ANSI/ACI 315, and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada, unless indicated otherwise.

.2 Obtain Departmental Representative's approval for locations of reinforcement splices other than those shown on placing drawings.

.3 Upon approval of Departmental Representative, weld reinforcement in accordance with CSA W186.

.4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

.1 Ship epoxy coated bars in accordance with ASTM A775A/A775M.

2.3 QUALITY CONTROL Source

.1 At least four (4) weeks prior to steel reinforcement installation, provide to Departmental representative, if requested, a certified copy of the mill test, setting out the results of physical and chemical analysis of steel reinforcing.

.2 If requested, inform the Departmental representative of proposed source of supplied materials.

Part 3 Execution

3.1 FIELD BENDING

.1 Do not field bend or field weld reinforcement except where indicated or authorized by Departmental Representative.

.2 When field bending is authorized, bend without heat, applying slow and steady pressure.

.3 Replace bars, which develop cracks or splits.

3.2 PLACING REINFORCEMENT

.1 Place reinforcing steel as indicated on placing drawings and in accordance with CSA-A23.1/A23.2.

.2 Use plain round bars as slip dowels in concrete.

.1 Paint portion of dowel intended to move within hardened concrete with one coat of asphalt paint.

.2 When paint is dry, apply thick even film of mineral lubricating grease.

.3 Concrete cover requirement of reinforcement is 75 mm, otherwise indicated. Maintain concrete cover of 75 mm during concrete pouring.

.4 24 hours prior to placing concrete, obtain Departmental Representative's approval of reinforcing material and placement.

.5 Metal pieces susceptible of rusting shall not touch the surface of concrete parts exposed to bad weather.

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Waste Management: 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 RELATED SECTIONS

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

.2 Section 03 10 00 - Concrete Forming and Accessories

.3 Section 03 20 00 - Concrete Reinforcing

.4 Section 03 41 00 – Precast Structural Concrete

.5 Section 31 05 17 - Aggregates

1.2 REFERENCES

.1 Abbreviations and Acronyms:

- .1 Cement: hydraulic cement or blended hydraulic cement (*b - where b denotes blended).
  - .1 Type GU or GUb - General use cement.
  - .2 Type MS or MSb - Moderate sulphate-resistant cement.
  - .3 Type MH or MHb - Moderate heat of hydration cement.
  - .4 Type HE or Heb - High early-strength cement.
  - .5 Type LH or LHb - Low heat of hydration cement.
  - .6 Type HS or HSb - High sulphate-resistant cement.
- .2 Fly ash:
  - .1 Type F - with CaO content less than 8%.
  - .2 Type CI - with CaO content ranging from 8 to 20%.
  - .3 Type CH - with CaO greater than 20%.
  - .4 Type S - granulated blast-furnace slag.

.2 American Society for Testing and Materials (ASTM)

- .1 ASTM C260, Specification for Air-Entraining Admixtures for Concrete
- .2 ASTM C309, Specification for Liquid Membrane-Forming Compounds for Curing Concrete
- .3 ASTM C494M, Specification for Chemical Admixtures for Concrete
- .4 ASTM C827, Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures
- .5 ASTM D1752, Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction

.3 Canadian Standards Association (CSA)

.1 CAN/CSA-A3000, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

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

.3 CAN/CSA G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.4 CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles.

.4 Government of Quebec, Department of Transports

.1 Cahier des charges et devis généraux (CCDG)

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Minimum four (4) week prior to starting concrete work submit to Departmental Representative manufacturer's test data and certification by qualified independent inspection and testing laboratory that following materials will meet specified requirements:

.1 Portland cement

.1 Blended hydraulic cement

.2 Supplementary cementing materials

.3 Grout

.4 Admixtures

.5 Aggregates

.6 Water

.7 Waterstops

.8 Waterstop joints

.9 Joint filler

.3 Provide certification that mix proportions selected will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with CAN/CSA-A23.1/A23.2.

.4 Provide certification that plant, equipment, and materials to be used in concrete comply with requirements of CAN/CSA-A23.1-A23.2.

.5 Provide results and reports for review by Departmental Representative and do not proceed without written approval when deviations from mix design or parameters are found.

.6 Concrete pours: provide 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.

.7 Concrete hauling time: provide for review by Departmental Representative deviations exceeding maximum allowable time of 120 minutes for concrete to be delivered to site of Work and discharged after batching.

1.4 QUALITY ASSURANCE

.1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.

.2 Provide Departmental Representative, minimum 4 weeks prior to starting concrete work, with valid and recognized certificate from plant delivering concrete.

.3 Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture will meet specified requirements.

.4 Minimum 4 weeks prior to starting concrete work, submit proposed quality control procedures for Departmental Representative's approval for following items:

.1 Falsework erection.
.2 Hot weather concrete.
.3 Cold weather concrete
.4 Curing
.5 Finishes
.6 Formwork removal
.7 Joints

1.5 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements:

.1 Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching.

.1 Do not modify maximum time limit without receipt of prior written agreement from Departmental Representative and concrete producer as described in CSA A23.1/A23.2.

.2 Deviations to be submitted for review by Departmental Representative.

.3 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

1.6 WASTE MANAGEMENT AND DISPOSAL

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

.2 Designate a cleaning area for tools to limit water use and runoff.

.3 Carefully coordinate the specified concrete work with weather conditions.

.4 Ensure emptied containers are sealed and stored safely for disposal away from children.

.5 Prevent plasticizers, water-reducing agents and air-entraining agents from entering drinking water supplies or streams. Using appropriate safety precautions, collect liquid or solidify liquid with an inert, non-combustible material and remove for disposal. Dispose of all waste in accordance with applicable local, provincial and national regulations.

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

Part 2 Products

2.1 PERFORMANCE CRITERIA

.1 Quality Control Plan: ensure concrete supplier meets performance criteria of concrete as established by Departmental Representative and provide verification of compliance as described in article 1.4 of PART 1 - QUALITY ASSURANCE.

2.2 MATERIALS

.1 Portland cement, for general purposes, GU, to CAN/CSA-A3001.

.2 Cementitious hydraulic slag: to CAN/CSA-A23.1/A23.2.

.3 Water: to CAN/CSA-A23.1/A23.2.

.4 Aggregates: to CAN/CSA-A23.1/A23.2. Coarse aggregates to be normal density.

.5 Air entraining admixture: to ASTM C260.

.6 Chemical admixtures: to ASTM C494. Departmental Representative to approve accelerating or set retarding admixtures during cold and hot weather placing.

.7 Concrete retarders: to ASTM C494 water based, low VOC. Do not allow moisture of any kind to come in contact with the retarder film.

.8 Premoulded joint fillers:

.1 Bituminous impregnated fibre board: to ASTM D1751.

.9 Elastomer cement for joints: cement made of polyurethane, from Sikaflex 1c or equivalent.

.10 Steel, Anchors: to CAN/CSA-G40.20/G40.21 Grade 350W or as indicated.

.11 Hot dip galvanizing: galvanize steel, where indicated, to ASTM A123/123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Production and CAN/CSA-G164, minimum zinc coating of 610 g/m^2.

2.3 MIXES

.1 Proportion concrete in accordance with CAN/CSA-A23.1/A23.2. Mix proportions as specified below.

.2 Ensure materials used in concrete mix have been submitted for testing and meet requirements of CSA A23.1.

.1 Co-ordinate construction methods to suit Departmental Representative concrete mix proportions and parameters.

.2 Identify and report immediately to Departmental Representative when concrete mix design and parameters pose anticipated problems or deficiencies related to construction.

.3 Departmental Representative to proportion concrete mix for normal including:

.4 Concrete:

.1 GU-b SF Portland cement.

.2 Minimal compressive strength at 28 days: 35 Mpa.

.3 Class of exposure: C-1.

.4 20 mm nominal size coarse aggregate.

.5 Slump at time and point of discharge: 80 mm to 125 mm.

.6 Air content 5% to 8 %.

.7 Chemical admixtures: water reducing strength increasing, set retarding, accelerating, strength increasing, air entraining, super plasticizers, following admixtures in accordance with ASTM C 494.

.8 Dry weight per cubic meter: 2 400 kg/m^3 minimum.

.9 Water/Cement content: lower than 0.40.

.10 Minimum cement content: 375 kg/m^3 of concrete.

.5 Ensure materials to be used in concrete mix have been submitted for testing.

.6 Co-ordinate construction methods with Departmental Representative to suit concrete mix proportions and parameters.

.7 Identify and report immediately to Departmental Representative when concrete mix design and parameters pose anticipated problems or deficiencies related to construction.

.3 Not with standing specification CAN/CSA_A23.1 and CAN/CSA-A23.4, the Contractor will provide the Departmental Representative with a mixing formula for the concrete. This formula is only a guide prepared according the aggregates supplied by the Contractor and submitted to the designated laboratory for all processes such as grading, washing, etc. It is the Contractor’s responsibility to use similar aggregates and to handle them so as to obtain good results. It is also Contractor’s responsibility to set the mixing guide formula depending on possible variations of aggregates or other concrete components.

2.4 CURING

.1 Storage and curing procedures shall meet the requirements of CAN/CSA-A23.1.

Part 3 Execution

3.1 PREPARATION

.1 Obtain Departmental Representative's written approval before placing concrete.

.1 Provide 24 hours minimum notice prior to placing of concrete.

.2 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.

.3 During concreting operations:

.1 Development of cold joints not allowed.

.2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.

.4 Pumping of concrete is permitted only after approval of equipment and mix.

.5 Ensure reinforcement and inserts are not disturbed during concrete placement.

.6 Prior to placing of concrete, obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing.

.7 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

.8 Contractor shall coordinate his pouring schedule in such a manner that uninterrupted pours are made for better uniformity of work.

.9 Do not place load upon new concrete until authorized by Departmental Representative.

.10 In locations where new concrete is dowelled to existing work, drill holes in existing concrete.

.1 Place steel dowels of deformed steel reinforcing bars and pack solidly with epoxy grout to anchor and hold dowels in positions as indicated.

3.2 CONSTRUCTION

.1 Does cast-in-place concrete work in accordance with CAN/CSA-A23.1/A23.2.

.2 Sleeves and inserts:

.1 Do not permit penetrations, sleeves, ducts, pipes or other openings to pass through joists, beams, column capitals or columns, 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 Confirm 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.

.3 Anchor bolts

.1 Set anchor bolts to templates in co-ordination with appropriate trade prior to placing concrete.

.2 Grout anchor bolts in preformed holes or holes drilled after concrete has set only after receipt of written approval from Departmental Representative.

.1 Formed holes: 100 mm minimum diameter.

.2 Drilled holes: diameter to manufacturers' recommendations.

.3 Protect anchor bolt holes from water accumulations, snow and ice build-ups.

.4 Set bolts and fill holes with epoxy grout.

.5 Locate anchor bolts used in connection with expansion shoes, rollers and rockers with due regard to ambient temperature at time of erection.

.4 Finishing

.1 Finish concrete in accordance with CAN/CSA-A23.1/A23.2.

.2 Use procedures noted in CAN/CSA-A23.1/A23.2 to remove excess bleed water. Ensure surface is not damaged.

.3 Use curing compounds compatible with applied finish on concrete surfaces.

.4 For concrete slab, execute a broom or brush groovy finish.

.5 Water stops:

.1 Install water stops to provide continuous water seal.

.2 Do not distort or pierce water stop in way as to hamper performance.

.3 Do not displace reinforcement when installing water stops.

.4 Use equipment to manufacturer's requirements to field splice water stops.

.5 Ties water stops rigidly in place.

.6 Use only straight heat sealed butt joints in field.

.7 Use factory welded corners and intersections unless otherwise approved by Departmental Representative.

.6 Joint fillers:

.1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Departmental Representative.

.2 When more than one piece is required for joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.

.3 Locate and form construction expansion joints as indicated.

.4 Install joint filler.

.5 Use 12 mm thick joint filler to separate slabs-on-grade from vertical surfaces and extend joint filler from bottom of slab to finished slab surface unless indicated otherwise.

3.3 TOLERANCE

.1 Concrete finishing tolerance in accordance with CAN/CSA-A23.1/A23.2

3.4 FIELD QUALITY CONTROL

.1 Inspection and testing of concrete and concrete materials will be carried out by a Testing Agencies designated by Departmental Representative in accordance with CAN/CSA-A23.1/A23.2 and Section 01 45 00 - Quality Control.

.2 Departmental Representative will pay for costs of tests as specified in Section 01 29 83 - Payment Procedures: Testing Laboratory Services.

.3 Departmental Representative will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.

.4 Non-destructive Methods for Testing Concrete shall be in accordance with CAN/CSA-A23.1/A23.2.

.5 Inspection or testing by Departmental Representative will not augment or replace Contractor quality control nor relieve him of his contractual responsibility.

.6 Ensure test results are distributed for discussion at pre-pouring concrete meeting between testing agency and Departmental Representative.

3.5 CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.

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

.1 Divert unused concrete materials from landfill to local quarry or facility after receipt of written approval from Departmental Representative.

.2 Provide appropriate area on job site where concrete trucks and be safely washed.

.3 Divert unused admixtures and additive materials (pigments, fibres) from landfill to official hazardous material collections site as approved by Departmental Representative.

.4 Do not dispose of unused admixtures and additive materials into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard.

.5 Prevent admixtures and additive materials from entering drinking water supplies or streams.

.6 Using appropriate safety precautions collect liquid or solidify liquid with inert, non-combustible material and remove for disposal.

.7 Dispose of waste in accordance with applicable local, Provincial/Territorial and National regulations.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

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

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

- .1 ASTM A185/A185M-, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
- .2 ASTM C260, Standard Specification for Air-Entraining Admixtures for Concrete.

.2 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-1.40, Anticorrosive Structural Steel Alkyd Primer.
- .2 CAN/CGSB-1.181, Ready Mixed Organic Zinc-Rich Coating.

.3 Canadian Standards Association (CSA)

- .1 CAN/CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.
- .2 CSA-A23.3, Design of Concrete Structures.
- .3 CAN/CSA-A23.4- Precast Concrete - Materials and Construction.
- .4 CAN/CSA-A3000, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
  - .1 CSA-A3001, Cementitious Materials for Use in Concrete.
- .5 CSA-A251 - Qualification Code for Manufacturers of Architectural and Structural Precast Concrete.
- .6 CAN/CSA-G30.18 - Billet-Steel Bars for Concrete Reinforcement.
- .7 CAN/CSA-G40.20/G40.21-General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .8 CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles.
- .9 CAN/CSA-S6, Canadian Highway Bridge Design Code.
- .10 CSA-W47.1- Certification of Companies for Fusion Welding for Steel Structures.
- .11 CSA-W48.1-Carbon Steel Covered Electrodes for Shielded Metal Arc Welding.
- .12 CSA-W59- Welded Steel Construction (Metal Arc Welding).
- .13 CSA-W186, Welding of Reinforcing Bars in Reinforced Concrete Construction.

1.3 DESIGN REQUIREMENTS

.1 Design precast elements to CAN/CSA-A23.4 to carry handling stresses.

1.4 PERFORMANCE REQUIREMENTS

.1 Tolerance of precast elements to CAN/CSA-A23.4.

1.5 SUBMITTALS

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

.2 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 81 01 - Hazardous Materials.

.3 Submit shop drawings in accordance with CSA-A23.3 and CSA-A23.4 and include following items:

- .1 Details of prestressed and non-prestressed members, reinforcement and their connections.
- .2 Camber.
- .3 Finishing schedules.
- .4 Methods of handling and erection.
- .5 Openings, sleeves, inserts and related reinforcement.

.4 Submit copies of detailed calculations and design drawings for typical precast elements and connections for review by Departmental Representative 2 weeks prior to manufacture.

.5 Shop Drawings: submit drawings stamped and signed by qualified professional engineer registered or licensed in Province of Québec.

.6 Submit samples in accordance with Section 01 33 00 - Submittal Procedures. Submit sample number of each finish to be used on project to Departmental Representative.

1.6 QUALIFICATIONS

.1 Precast concrete elements to be fabricated and erected by manufacturing plant certified by Canadian Standards Association in appropriate categories according to CSA-A251.

.2 Precast concrete manufacturer to be certified in accordance with CSA's certification procedures for precast concrete plants prior to submitting tender and to specifically verify as part of tender that plant is currently certified in appropriate categories, such as Structural precast concrete products.

.3 Only precast elements fabricated in such certified plants to be acceptable to owner, and plant certification to be maintained for duration of fabrication, erection until warranty expires.

.4 Welding companies certified to CSA-W47.1.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Deliver, handle and store precast/prestressed units according to manufacturer's instructions.

.2 Protect unit corners from coming in contact with earth to prevent from staining.

1.8 WASTE MANAGEMENT AND DISPOSAL

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

Part 2 Products

2.1 MATERIALS

.1 Articulated concrete mats:

.1 Articulated in both directions with polypropylene ropes.

.2 Dimensions : 3 050 mm x 6 100 mm x 203 mm

.2 Cement, aggregates, water, admixtures: to CAN/CSA A23.1 and CAN3 A23.4.

.3 Reinforcing steel: to CAN/CSA-G30.18.

.4 Hardware and miscellaneous materials: to CAN/CSA-A23.1.

.5 Forms: to CAN3-A23.4.

.6 Anchors and supports: to CAN/CSA G40.21 Type 350 W, galvanized.

.7 Welding materials: to CSA-W48.1.

.8 Welding electrodes: to CSA-W48.1 and certified by Canadian Welding Bureau.

.9 Galvanizing: hot dipped galvanizing with minimum zinc coating of 610 g/m^2 to CAN/CSA-G164.

2.2 MIXES

.1 Concrete.

.1 Proportion normal density concrete in accordance with CAN/CSA-A23.1, to give physical properties following Section 03 30 00 – Cast-in-Place Concrete.

2.3 MANUFACTURED UNITS

.1 Manufacture units in accordance with CAN3-A23.4 and CSA-A251.

.2 Mark each precast unit to correspond to identification mark on shop drawings for location with date cast on part of unit which will not be exposed.

.3 Provide hardware suitable for handling elements.

2.4 FINISHES

.1 Finish units to CSA-A23.4.

2.5 SOURCE QUALITY CONTROL

.1 Provide Departmental Representative with certified copies of quality control tests related to this project as specified in CAN3-A23.4 and CSA-A251.

.2 Provide records from in-house quality control programme based upon plant certification requirements to Departmental Representative for inspection and review.

.3 Upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel supplied, showing physical and chemical analysis.

.4 Precast plants should keep complete records of supply source of concrete material, steel reinforcement, prestressing steel and provide to Departmental Representative for review upon request.

Part 3 Execution

3.1 ERECTION

.1 Do precast concrete work in accordance with CSA-A23.3 and A23.4 and CAN/CSA-S6.

.2 Do welding in accordance with CSA-W59, for welding to steel structures and CSA-W186, for welding of reinforcement.

.3 Erect precast elements within allowable tolerances as specified.

.4 Non-cumulative erection tolerances in accordance with CAN3-A23-4.

.5 Uniformly tighten bolted connections with torque indicated.

.6 Clean field welds with wire brush and touch-up galvanized finish with zinc-rich primer.

3.2 VERIFICATION

.1 Ensure concrete supplier meets performance criteria of concrete as established in Part 2 B Products, by Departmental Representative and provide verification of compliance as described in PART 1 - QUALITY ASSURANCE.

3.3 CLEANING

.1 Use cleaning methods as reviewed by Departmental Representative before cleaning soiled precast concrete surfaces.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 01 61 00 – Common product requirements

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

.4 Section 09 97 19 – Painting Exterior Metal Surfaces

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)

.1 ASTM A6/A6M, Standard Specification for general Requirements for Rolled Structural Steel Bars, Plater, Shapes and Sheet Piling.

.2 ASTM A53, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Steamless.

.3 ASTM A 36/A36M, Specification for Structural Steel.

.4 ASTM A123/123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Production

.5 ASTM A 307, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.

.6 ASTM A563, Standard Specification for Carbon and Alloy Steel Nuts

.7 ASTM A 780, reparations of damaged galvanized coating.

.2 American National Standards Institute, (ANSI)

.1 AWS D3.6M, Specification for underwater welding.

.3 Canadian Standards Association (CSA International)

.1 CAN/CSA G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 CAN/CSA-G164-M, Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CAN/CSA-S16-S1, Limit States Design of Steel Structures.

.4 CSA-S136.S1, Limit States Design of Steel Structures (Specification for the Design of Cold-Formed Steel Structural Members).

.5 CSA-S136.1, Commentary on CSA Standard S136.

.6 CSA W47.1, Certification of Companies for Fusion Welding of Steel Structures.

.7 CSA W48, Filler Metals and Allied Materials for Metal Arc Welding.

.8 CSA W59, Welded Steel Construction (Metal Arc Welding) [Metric].

.4 Canadian Institute of Steel Construction

.1 Handbook of steel construction

.5 The Master Painters Institute (MPI)

.1 Architectural Painting Specification Manual

1.3 SUBMITTALS PROCEDURES

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for sections, plates, pipe, tubing and bolts and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit one copy of WHMIS MSDS in accordance with Section 01 35 29 - Health and Safety Requirements and Section 01 35 43 - Environmental Procedures.

.1 For finishes, coatings, primers, and paints applied on site: indicate VOC concentration in g/L.

.3 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Québec.

.2 Indicate materials, core thicknesses, finishes, connections, joint, methods of anchorage, number of anchors, supports, reinforcement, details, and accessories.

.3 Submit shop drawings, including materials processing and assembly, and the list of equipment and materials in accordance with Section 01 33 00 - Submittal Procedures.

.4 Erection drawings: indicate details and information necessary for assembly and erection purposes including:

.1 Description of methods.

.2 Sequence of erection.

.3 Type of equipment used in erection.

.4 Temporary walers.

.4 Ensure Fabricator drawings showing designed assemblies, components and connections are stamped and signed by qualified professional engineer licensed in the province of Quebec, Canada.

1.4 QUALITY ASSURANCE

.1 Submit 2 copies of mill test reports 4 weeks prior to fabrication of structural steel.

.1 Mill test reports to show chemical and physical properties and other details of steel to be incorporated in project.

.2 Provide mill test reports certified by metallurgists qualified to practice in province of Quebec, Canada.

.2 Provide structural steel Fabricator's affidavit stating that materials and products used in fabrication conform to applicable material and products standards specified and indicated.

1.5 QUALITY CONTROL

.1 Departmental Representative will be responsible for services of testing and inspections from independent agencies. The cost of these services will be borne by the Departmental Representative.

.2 The fabrication work will be inspected by sampling of 10%

.1 All welds shall be made as shown on the fabrication drawings and in accordance with CSA W59-03 Welded Steel Construction (arc welding). Compliance with welding procedures when carrying out the work will be checked. Welds will be inspected under section 12 of the CSA W59-03. Fillet welds shall be inspected visually and by magnetic particles.

.3 The use of test organisms and inspections does not relieve Contractor of its responsibility for the execution of works in accordance with the requirements of the contract documents.

.4 .Provide work areas and access safe for testing on site, as required by the testing agency and as authorized by the Departmental Representative.

.5 Remove defective or deemed non-compliant with the contract documents and rejected by the Departmental Representative, either because they were not conducted according to the rules of the art, either because they were made of materials or defective products, even if they have already been included in structure. Replace or repair components as required by the contract documents.

1.6 TRANSPORTING, STORING AND HANDLING

.1 Packing, Shipping, Handling and Unloading:

.1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 – Common Product Requirements.

.2 Handle steel pieces so as to avoid permanent deformations.

.3 Handle with care steel pieces that have received a special coating.

.2 Storage and Protection:

.1 Surfaces must be cleaned of their protective coating during final cleaning. Provide instructions for the removal of these protections.

.2 If applicable, exposed surfaces of stainless steel components must be covered with a strong self-adhesive paper or plastic wrap before shipment to the site.

.3 Store materials in accordance with manufacturer's recommendations in a clean, dry, well-ventilated area.

.4 Replace defective or damaged materials with new.

1.7 WASTE MANAGEMENT

.1 Sort and remove for reuse waste in accordance with Section 01 74 21 - Construction/Demolition Waste Management.

Part 2 Products

2.1 MATERIALS

.1 Structural steel: to CAN/CSA-G40.20/G40.21 Grade 350W or as indicated.

.2 Welding materials: to CSA W59 and certified by Canadian Welding Bureau.

.3 Welding electrodes: to CSA W48 Series.

.4 Anchor bolts: to ASTM A307, as indicated

.5 Nuts and washers: following asked bolts, to develop full strength. Lubricated in accordance with ASTM A563.

.6 Hot dip galvanizing: galvanize steel, where indicated, in accordance with ASTM A123/123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Production and to CAN/CSA-G164, minimum zinc coating of 600 g/m^2.

.7 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

2.2 FABRICATION

.1 Fabricate structural steel in accordance with CAN/CSA-S16, CAN/CSA-S136 and in accordance with reviewed shop drawings.

.2 Bolts Tightening: use tightening torque in accordance with CISC

.3 Continuously seal members by continuous welds where indicated. Grind smooth.

.4 Exposed welds should be continuous throughout the length of the joint; they must be filed down or ground to present a smooth, even surface.

.5 Where possible, fit and shop assemble work, ready for erection.

2.3 SHOP PAINTING

.1 All steel components to be hot-dip galvanized, not painted, except for recovered bollards.

2.4 STEEL COMPONENTS

.1 Plates, steel bars and handle to CAN/CSA-G40.20/G40.21, Grade 350W.

.2 Welding: in accordance with CSA W59.

.3 Welding electrodes: to CSA W48 Series.

.4 Ensure exposed welds or extremity of members is grinded smooth and flush.

.5 Components to be hot-dip galvanized.

Part 3 Execution

3.1 EXAMINATION

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

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

3.2 GENERAL

.1 Structural steel work: in accordance with CAN/CSA-S16 and CAN/CSA-S136.

.2 Provide a letter of validation of the steel manufacturer and welders as evidence of certification by the Canadian Welding Bureau, Division 2.1.

.3 Welding: in accordance with CSA W59.

.4 Companies to be certified under Division 2 of CSA W47.1 for fusion welding of steel structures and/or CSA W55.3 for resistance welding of structural components.

3.3 GALVANIZING

.1 Recovered Bollards to be painted in accordance to Section 09 97 19 – Painting Exterior Metal Surfaces

.2 Surface preparation of items to be hot dip galvanized with:

- .1 Sand blasting to SSPC-10.
- .2 Acid cleaning

.3 Clean and prepare surfaces so that zinc coat bond perfectly to all surfaces.

.4 An item shall be completely fabricated before to be galvanized. Galvanizing bath shall be sufficiently large in order that items to be galvanized in only one dip.

.5 Hot dip galvanization to obtain a zinc continuous layer, uniform thickness for complete steel protection after erection.

.6 Welding not allowed after galvanization

.7 Galvanize different items respecting the following rate:

- .1 Bolts and nuts: 460g/m^2

.2 Sections, plates, and bars: 705 g/m^2

.8 Clean thread of bolts in such a way that the nuts have a normal clearance on them after galvanization

.9 Manufacturer shall take all necessary measures to avoid fragilization, warping or deformation of an item during galvanization. It is recommended to follow the method specified in ASTM-A143 and ASTM-A384 as well as the appendices of ASTM 123/123M.

.10 All item deformed or warped will be rejected except in the Manufacturer rectifies the item in such a quay that neither the piece nor the galvanization are damaged

.11 Manufacturer shall carry out testing to determine quality of the adherence and the repair of zinc layer specified in ASTM A123/123M

3.4 INSTALLATION

.1 Surface welding: welding work must be done in conformity with the requirements of the standards indicated to article 1.3 of this section, and with the dimensional tolerances specified in the standards of this article. The welders must be qualified according to Canadian Welding Bureau for the type of welding corresponding to work carried out.

.2 Finish: Carefully finish the various parts of work. Cutting, carving, boring and machining shall be done with care and precision. Finished components must meet prescribed alignment requirements and be free from torsion, curves, open joints, sharp corners and ridges.

.3 On-site additional splices: obtain Departmental Representative’s approval before making on-site additional splices (to facilitate transport and assembly of elements). No additional cost for expenses incurred by the additional splices done on-site.

.4 All the adjacent welding with galvanized parts will receive a coat of rich zinc protective paint.

3.5 CONNECTION TO EXISTING WORK

.1 Verify dimensions and condition of existing work, report discrepancies and potential problem areas to Departmental Representative for direction before commencing fabrication.

3.6 MARKING

.1 Mark materials in accordance with CAN/CSA G40.20/G40.21. Do not use die stamping. If steel is to be left in unpainted condition, place marking at locations not visible from exterior after erection.

.2 Match marking: shop mark bearing assemblies and splices for fit and match.

3.7 ERECTION

.1 Erect structural steel, as indicated and in accordance with CAN/CSA-S16, CAN/CSA-S136 and in accordance with reviewed erection drawings.

.2 Does welding work in accordance with CSA W59 unless specified otherwise.

.3 Field cutting or altering structural members, to approval of Departmental Representative.

.4 Erect steel accurately, level, plumb straight, line up and adjusted with precision, joints and crossing well fixed.

.5 Provide and install suitable anchorings approved by Departmental Representative such as studs, tie-rods, anchor bolts, expansion bolts, etc.

.6 Visible fastening to be compatible with crossed or fixed to material.

.7 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.

.8 Clean with mechanical brush and touch up coat protection to bolts, rivets, welds or burned or scratched surfaces at completion of erection.

.9 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

.10 Continuously seal members by continuous welds where indicated. Grind smooth.

.11 Allowable tolerances for bolt holes:

.1 Matching holes for bolts to register so that a gauge 2 mm less than diameter than hole will pass freely through assembled members at right angles to such members.

.2 Finish holes not more than 2 mm in diameter larger than diameter of bolt unless otherwise specified by Departmental Representative.

.3 Centre-to-centre distance between 2 holes of a group of holes to vary but not more than 1 mm from dimensioned distance between such holes..

.4 Centre-to-centre distance between any group of holes to vary not more than following:

Centre-to-centre (m)	Difference (±) (mm)
Less than 10	1
10 to 20	2
20 to 30	3

3.8 FIELD QUALITY CONTROL

.1 Inspection and testing of materials and workmanship will be carried out by a testing laboratory designated by Departmental Representative.

.2 Provide safe access and working areas for testing on site, as required by testing agency and as authorized by Departmental Representative.

.3 Submit test reports to Departmental Representative within 2 weeks of completion of inspection.

.4 Departmental Representative will pay costs of tests as specified in Section 01 29 83 - Payment Procedures: Testing Laboratory Services.

3.9 CLEANING

.1 .Cleaning up work: perform cleanup in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work site clean at the end of each workday.

.2 Final Cleaning: upon completion remove materials / surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management.

.1 Remove bins and recycling bins from site and dispose of materials at appropriate facilities.

3.10 PROTECTION

.1 Protect installed products and components against damage during construction.

.2 Repair damage to adjacent materials and equipment from installation of steel components.

END OF SECTION

Partie 1 General information

1.1 SECTION CONTENT

.1 This section includes specifications for the construction of wood embankments to be built.

1.2 RELATED SECTIONS

.1 Section 06 05 73 – Wood Treatment

.2 Section 05 50 00 – Metal Fabrications

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Sort and recycle waste in compliance with section 01 74 21 – Construction/demolition waste management and disposal.

Partie 2 Products

2.1 MATERIALS

.1 Steel

- .1 All mechanical bolts, lag screw, drift bolt and nails will be of medium construction steel, in compliance with standard ASTM-A307.
- .2 All steel parts must be galvanized in compliance with standards ASTM A123/123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Production.
  - .1 Galvanize the various parts in accordance with the following rates:
    - .1 Bolts and nuts: 460 g/m2;
    - .2 Section, plates and rods: 705 g/m2
- .3 Threads will meet the specifications of standard ANS/B1-1, class 2A.
- .4 Washers will be made of grey cast iron or steel.
- .5 Mechanical bolts, lag screw and drift bolt will have forged heads.
- .6 The length of bolts specified does not include the head; the length of the bolt's threads is 100 mm.
- .7 The spiral galvanized nails will be 250 mm long.
- .8 All drift bolts will be properly worked down and will have 9 mm countersunk heads, larger than the diameter used.
- .9 All drift bolts holes will be drilled to a diameter of 2 mm smaller than the diameter of the bolts used and 75 mm shorter than their length;
- .10 The lag bolts will be threaded and have hexagonal heads;
- .11 The lag bolt holes must conform to the following:

.1 The pilot hole for the bolt core must be the same diameter as the bolt core and the same height as the bolt core length without the thread.

.2 The diameter of the pilot hole for the threaded portion must be 60 to 75 percent of the diameter of the bolt core for the length equal to the threaded portion of the bolt.

.3 The threaded portion of the screw must be inserted into the pilot hole by turning the screw with a wrench and not by using a hammer.

.4 Soap or any other lubricant that is not petroleum based may be used on the screw or in the pilot hole in order to facilitate insertion and prevent damage to the screw.

.12 In the wood structure, each mechanical bolt will be equipped with two (2) flat washers with a diameter equal to four (4) times the bolt diameter. The heads and nuts of the bolts will also lie evenly over the washers. They will be inserted flush with the wood pieces on all outside faces of the crib structures and wherever this procedure is specified or required, as directed by the Departmental Representative. The carriage bolt holes will be drilled to the same diameter as the bolts used.

.13 Generally speaking, the length of the nuts and bolts in the wood structure is determined as follows, except where otherwise specified:

.1 Drift bolt and lag screw: total width of parts to secure less 50 mm.

.2 Mechanical bolt with two (2) non-countersunk washers: total width of parts to secure less 100 mm.

.3 Mechanical bolt with two (2) washers, only one of which is countersunk: total width of parts to secure plus 50 mm.

.4 Mechanical bolt with two (2) countersunk washers: total width of parts to secure.

.5 Common nails and spiral nails: width of thinner part to be secured multiplied by two and a half (2.5).

.2 Wood

.1 Wood to be sustainable forest management in compliance with CSA_ISO 41001 or FSC.

.2 All wood used in the construction of the embankment will be treated with pressurized CCA in accordance with CAN/CSA-O80-M, except for ballast floor. Retention to be 24 kg/m^3 as required for marine application in accordance with requirements.

.3 All wood varieties will be in compliance with the requirements of the NLGA (National Lumber Grades Association) entitled ¨Standard Grading Rules for Canadian Lumber.¨

.4 The coastal Douglas fir tree and the Pacific Coast hemlock will meet the requirements of the British Columbia Lumber Manufacturer’s Association entitled ¨Standard Specifications for Construction Grade.¨

.5 The spruce, jack pine and eastern hemlock will meet the requirements of the latest standard grading rules of the ¨Eastern Spruce Grading Committee¨ approved and

published by the Canadian Lumbermen's Association, the Quebec Lumber Manufacturers Association and the ¨Maritime Lumber Bureau,¨ with the exception of the balsam fir which will not be accepted although it is mentioned in rule No. 1.

.6 Square timber and embankment wood (narrow side: greater than or equal to 127 mm): the wood introduced into the construction will be coastal Douglas fir or Pacific Coast hemlock, eastern hemlock, jack pine, red pine or tamarack. All wood used will be of the varieties mentioned and of No. 2 structure quality or better in compliance with paragraph 130.C of the NLGA standard for beams and stringers and 131.C for poles and square timber. However, no altered wood (soft rot) will be accepted.

.7 Planks and dim wood (thickness greater or equal to 51 mm and smaller than 127 mm, width greater or equal to 127 mm): all wood used will be from the S-P-F variety group or eastern hemlock, red pine or tamarack. No. 2 structure quality, or better, in compliance with paragraph 124.C of the NLGA standard.

.8 The wood will be double end trimmed at a right angle before treatment following standard NLGA 748-B.

.9 Spruce and balsam fir will not be accepted when treated wood is specified.

.10 All material treated under pressure requiring cutting, in order to be adjusted, will be coated, while dry, with three (3) layers of preservative as is required in standard CAN/CSA-080-M. All holes in timber pieces will be treated that way

.11 Ends of wood pieces exposed to sea water and placed over elevation of plastic sheathing, vertical poles and cut pieces must have, in addition to the 3 layers of preservative, be equipped with a prong mending plate.

.3 Ballast stone

.1 Stone measuring 300 to 500 mm in diameter.

.2 The smallest size stones must not be less than 250 mm.

.3 The stone used must be quarried from hard and durable stone. The use of shale or slate and round stones will not be accepted in any part of the structure. The stones used must be free of planes of weakness such as stratification, bedding, cracks and argillite beds.

.4 The stone must have a minimum density of 2,650 kg per cubic meter, show an absorption rate of less than 0.5% (ASTM-C127) and provide less than 1.5% loss in magnesium sulfate durability tests after 5 cycles (ASTM-C88). Same criteria apply to 150-25 mm stone.

.5 The ballast stone must be evenly distributed between the minimum and maximum values.

.6 It is the sole responsibility of the Contractor to ensure the availability of usable sources of supply and the quantity and sizes of stone that can be obtained.

Partie 3 Execution

3.1 BEST MANAGEMENT PRACTICES FOR THE USE OF TREATED WOOD IN AQUATIC

.1 The construction must comply with the following document: Best Management Practices for the use of treated wood in aquatic and other sensitive environments.

.2 The Contractor shall make every effort to adhere to good practices. Such as:

- .1 Wood must be protected by tarps during transport and until its use.
- .2 Wood must be handled carefully to avoid damage and exposure of sections of non-impregnated wood. Damaged sections must be treated with an approved product.
- .3 Store the material far from any waterway before use. Be sure the material is stored on well-drained land and not directly on debris or vegetation.
- .4 The construction of crib structures must be carried out far enough from any waterway or other sensitive areas to avoid contamination that could be caused by debris or sawdust.
- .5 Debris and sawdust must be recovered and disposed of according to the regulations in effect for such material. If these materials are temporarily stored on-site, they must be stored between tarps or in a waterproof container.
- .6 If the wood is treated with an oil-based preservative, temporarily set up a boom and absorbent material to contain the film.

3.2 WOOD EMBANKMENT

.1 Build 254 mm x 254 mm wood embankments, as specified on the plans.

.2 These embankments will be built on site so that faces, stringers, bolsters etc, are installed horizontally. They will be built in compliance with the plan and will have the specified dimensions.

.3 These embankments will be entirely filled up to the internal face of the joists with ballast stone.

.4 If, after immersion, cages are unaligned, the Contractor will have to remove ballast stone, at his own expense until the cages float and will have to replace them at the proper locations.

.5 The Contractor will have to notify the department representative, fifteen (15) days before the probable immersion date of the cages and these will not be immersed before the department representative has given written approval.

.6 Preparation of foundation:

.1 Prior to embankment installation, the Contractor will have to conduct a survey of the zone where the embankment will be placed. The Contractor will have to add 150-25 mm crushed stone in order to respect the levels required.

.2 If massive rock is encountered at the embankment site, it will be cleaned and bottom parts of the embankments will be adjusted to the bedrock. This same method will be used if a section of the sea floor were to be of an inferior level due to erosion during cribwork.

.7 Bottom pieces:

.1 The bottom parts include the lower layers of the embankment. They will have 254 mm of squaring and be placed fore and aft or crosswise, as required.

.2 Crosswise bottom parts will be of one length.

.3 They will be secured to each piece of wood they cross, as specified in the plans.

.4 The bottom parts will be secured to each vertical pole they cross using a machine bolt, 25 mm in diameter of the appropriate length. Bottom parts will be placed horizontally.

.5 Bottom pieces placed longitudinally to be not less than 7 600 mm in length.

.6 Bottom parts placed fore and aft will be butt jointed at mid-distance between the crosswise bottom parts on a 1 200 mm long block placed above or below and anchored with machine bolts 25 mm in diameter and of the appropriate lengths.

.8 Ballast platform:

.1 The ballast platform will be made up of 200 to 250 mm diameter logs, placed, head to foot to bottom parts. They will be of required length and their joint will be done on a bottom part, as specified in the plans.

.2 The logs will be placed on the second layer of the bottom parts. Each log extremity will be anchored to bottom parts using 25 mm diameter drift bolt of appropriate length.

.9 Stringers and cross-tie

.1 Stringers and cross-tie will be made up of 254 mm squaring pieces, as specified on the plan. Cross-tie will be placed on one horizontal length, while stringers with length to be not less than 7 600 mm.

.2 These pieces will be secured to each crossing with a bolster or a facing timber using a 25 mm diameter drift bolt of appropriate length. They will also be secured to each crossing with a vertical pole using a machine bolt 25 mm in diameter of the appropriate length.

.10 Vertical poles

.1 Vertical poles will be made up of wood pieces with 254 mm squaring, situated as specified on the plans. They will be of one length going from below the bottom parts up to the upper face of the wood joists.

.2 Poles will be secured to each intersection with a bottom part, cross-tie, ledger, wall, crown, using 25 mm diameter machine bolts of the appropriate length.

.11 Stringers

.1 254 mm squaring wood stringers will be installed on the embankment.

.2 Stringers will be placed as specified on the plans. They will be secured to each cross-tie using a 24 mm diameter drift bolt of the appropriate length.

.3 Stringers to be not less than 7 600 mm in length.

3.3 LADDERS

.1 Ladders will be placed and solidly secured to the pier, as specified on the plans.

.2 They will be made with 2 L 152x 89 x 12.7 mm, 25 mm in diameter and 700 mm long rungs, placed 300 mm c/c. Open space behind rungs must be at least 150 mm. All steel parts to be hot dip galvanised.

.3 Each L 152x 89 x 12.7 mm will be fixed to wall parts using 19 mm diameter lag screw of the appropriate length. At the top of the ladder, a 25 mm diameter steel handle will be recessed into the wheel-guard. This handle will have a total length of 700 mm. Its extremities will be curbed and recessed into the wheel-guard. All steel parts to be hot dip galvanised.

3.4 WOODEN WHEEL-GUARDS

.1 A wooden 254 mm x 254 mm wheel guard will be constructed in compliance with plans.

.2 The wheel guard will be secured to blocks and concrete slabs using 24 mm diameter threaded bars of appropriate length and chemical anchor.

.3 The top of wheel guards will be level, of the proper elevation and their upper rims will have a 25 mm bevel.

.4 The wheel guard will rest on 75 mm x 254 mm x 600 mm long blocks placed at every 1 500 mm on center.

.5 Wooden pieces to be not less than 6 000 mm in length

3.5 SHEATHING

1 Under water plastic sheathing

.1 The recycled plastic boards have grooves to fit into one another.

.2 The recycled plastic boards will be installed in the bottom part of the crib structures or others, as shown in the plans.

.3 The recycled plastic sheathing will be fixed to the cap plate and siding using lag bolts, as shown on the plan.

.2 Wood and recycled plastic sheathing

.1 100 x 203 mm wood sheathing pieces and 100 x 150 recycled plastic pieces will be installed in specified locations. Leave a 300 mm space between each piece.

.2 Pieces will be of one length starting from low tide level or in compliance with specifications up to the concrete slab.

.3 The wood sheathing will be installed in the upper part of the crib structures, as shown in the plans.

.4 The lower part will be bevelled, as shown in the plan.

.5 Each piece will be secured to concrete slab using mechanical anchor and to wall parts using heat galvanized lag screws, as specified on plans.

3.6 WOOD FLOORS

.1 A 75 x 203 mm treated wood floor will be installed on gangway base.

.2 A temporary 102 x 203 mm untreated wood floor will be installed on crib. This temporary floor shall be removed for construction of roller compacted concrete slab.

.3 Each piece will be secured to the existing joists using 150 mm galvanized lag screws at each joint intersection.

END OF SECTION

Part 1 General information

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittals procedures

.2 Section 01 74 21 – Construction/demolition waste management and disposal.

.3 Section 06 03 00 -Wood embankment

1.2 REFERENCES

.1 American Wood-Preservers' Association (AWPA)

- .1 AWPA M2, Standard Inspection of Treated Wood Products.
- .2 AWPA M4, Standard for the Care of Preservative-Treated Wood Products.

.2 Canadian Standards Association (CSA)

- .1 CAN/CSA O80, Wood preservation.
- .2 CSA O80.201, This Standard covers hydrocarbon solvents for preparing solutions of preservatives.

.3 Best Management Practice for the Use of Treated Wood in Aquatic Environments (BMPs).

1.3 REQUIREMENTS FROM REGULATORY AGENCIES

.1 Each piece of treated wood or batch of treated wood pieces must display a label.

1.4 CERTIFICATES

.1 Submit required certificates in compliance with specifications from section 01 33 00 - Documents and samples to be submitted.

.2 Each piece of lumber to be identified by CSA O322 certified stamp.

.3 Submit the following information with regards to materials impregnated under pressure with a preservation product, after they have been certified by an authorized representative from a treatment factory.

- .1 Information included in standard AWPA M2 and modifications listed in standards from the CSA O80 series, under the heading of ¨Additional requirements to standard AWPA M2, applicable to the prescribed treatment.¨
- .2 The degree of humidity, once drying is complete following treatment with a water-soluble preservation product.
- .3 The acceptable types of paints, stains and clear finishing products which could be applied to treated wood materials.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Sort and recycle waste in compliance with specifications of section 01 74 21 – Construction/demolition waste management and disposal.

.2 Wood treated with a preservation product must be separated from materials to be recycled or reused.

.3 Send treated wood ends, waste and sawdust to a landfill site approved by the department representative.

Partie 2 Products

2.1 MATERIALS

.1 Chemical preservation products:

.1 Hydrosoluble CCA in compliance with standards from CSA O80 series.

Partie 3 Execution

3.1 INCISION

.1 Timber over 64 mm thick must be incised, all according to Article 9.8 of the CSA O80.

3.2 CONDITIONING

.1 Except for materials to be treated with a water-soluble preservative and previously before treatment, heat dried or non-dried wood to remove moisture and improve the permeability and absorption properties.

3.3 PRESERVATION TREATMENT

.1 Treat materials, with an hydrosoluble CCA preservation product, in order to obtain a net retention of 290 kg/m3 in compliance with the requirements from the standard O80 series for usage in a marine environment

.2 Carry out the preservation treatments in compliance with the recommendations from the Best Management Practices for the Use of Treated Wood in Aquatic Environments (BMP).

.3 Dry wood materials after treatment with hydrosoluble product to reach an acceptable moisture content.

3.4 TREATMENTS CONDUCTED ON SITE

.1 Carry out work in compliance with standard AWPA M4 and modifications listed in standards from the CSA O80 series, under the heading of ¨Additional requirements to standard AWPA M2, applicable to the prescribed treatment¨.

.2 Remove all chemical product deposits from wood pieces on which a finishing product will be applied.

END OF SECTION

Part 1 General information

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 01 74 21 – Construction/demolition waste management and disposal.

.3 Section 06 05 73 – Wood treatment.

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)

.1 ASTM A307, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.

.2 National Lumber Grades Authority (NLGA)

.1 Standard Grading Rules for Canadian Lumber.

1.3 SHOP DRAWINGS

.1 Submit required shop drawings in compliance with section 01 33 00 - Documents and samples to be submitted.

.2 Drawings must show the construction and assembly details, profiles, attachments and other related details.

.3 Drawings must specify the materials, finishes, thicknesses and hardware parts.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Transport, store and handle material and materials in compliance with section 01 61 00 – Common product requirements.

.2 Protect materials against humidity and damages during and after delivery.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Sort and recycle waste in compliance with section 01 74 21 – Construction/demolition waste management and disposal.

Part 2 Products

2.1 MATERIALS

.1 Hardwood must meet the following standards:

.1 All wood varieties will comply with National Hardwood Lumber Association (NHLA).

.2 AWMAC custom grade, moisture content as specified.

.3 Wood varieties are Yellow Birch, Hard Maple or Oak.

.4 Wood to be untreated.

.2 Lag screw: made of galvanized steel, type and size appropriate for the application, in compliance with standard ASTM A-307.

Part 3 Execution

3.1 IMPLEMENTATION

.1 Install sheathing, level and in alignment, at all locations specified in drawings.

.2 Solidly affix and anchor sheathing as specified on the plans.

.3 Use lag screws that are of the appropriate length. Work must be done with precision and be level, true and in alignment, at all locations specified in drawings.

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 01 45 00 - Quality Control

.4 Section 05 50 00 – Metal fabrications

1.2 REFERENCES

.1 The contractor must comply with the codes, standards and regulations, as well as with the good practice rules as recommended by the following associations, related to the works to be executed. The federal laws and regulations prevail on the other codes and standards.

.1 CSA, Canadian Standards Association

.2 ANSI, American National Standards Institute

.3 API, American Petroleum Institute

.4 ASM, American Society for Metals

.5 ASTM, American Society for Testing and Materials

.6 AWWA, American Water Works Association

.7 BNQ, Bureau de Normalisation du Québec

.8 NBC, National Building Code

.9 MDDEP, le ministère du Développement durable, de l'Environnement et des Parcs du Québec

.10 MPI, Master Painters Institute

.11 CSST, Safety code for building works

.12 NACE, National Association of Corrosion Engineers

.13 NFPA, National Fire Protection Association

.14 CGSB, Canadian Government Standards Board

.15 SSPC, Steel Structures Painting Council

.16 ULC, Underwriters Laboratory of Canada

.2 The edition prevailing for the above-mentioned standards, laws and regulations is the one in force at the time of the Call for Tenders. However, Contractor must not restrict himself to the application of the above-mentioned standards only, but rather comply with all the standards to which his works could be related.

.3 The Contractor shall subject himself in particular to the following requirements:

.1 The Master Painters Institute (MPI)

.1 Maintenance Repainting Manual

.2 American Society for Testing and Materials International, (ASTM).

.1 ASTM D610-08, Test Method for Evaluating Degree of Rusting on Painted Steel Surfaces.

.2 ASTM D2369-07, Standard Test Method for Volatile Content of Coatings.

.3 CGSB, the Canadian General Standards Board

.1 CAN/CGSB-1.212 - Chromate and Lead Free Marine Primer for Steel and Light Alloy Surfaces

.2 CAN/CGSB-1.61 - Exterior and Interior Marine Alkyd Enamel

.4 SSPC, Steel Structures Painting Council

.1 Surface Preparation Commentary for Steel and Concrete Substrates: SSPC-SP COM

.2 Solvent Cleaning: SSPC-SP 1

.3 Commercial blast cleaning: SSPC-SP 6/NACE NO. 3

.4 Near-White Metal Blast Cleaning: SSPC-SP10/NACE n° 2.

.5 Measurement of Dry Coat Thickness with Magnetic Gauges SSPC-PA-2.

1.3 SUBMITTALS

.1 Product Data

.1 Two (2) weeks after contract approval, submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's for paint.

.2 Samples

.1 Submit for review and acceptance of each unit.

.2 .2 Samples will be returned for inclusion into work.

.3 Upon request, Departmental Representative will furnish qualified products list of paints.

.3 Paints that do not appear on MPI Approved Products List must be approved by Departmental Representative before use on project. When it is proposed to use non-qualified paint, submit 2 L sample of paint to Departmental Representative at least 2 weeks prior to commencement of painting for analysis and acceptance. Mark samples with name of project, its location, paint manufacturer's name and address, name of paint, MPI standard number and manufacturers paint code number.

.4 Quality Insurance Certificates:

.1 Submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.5 Closeout submittals

.1 Submit test reports showing compliance with specified performance characteristics and physical properties

.6 Manufacturer's Instructions

.1 Submit manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

.1 Qualifications:

.1 Qualified journeypersons as defined by local jurisdiction to be engaged in painting work.

.2 Apprentices: may be employed provided they work under direct supervision of qualified journeypersons in accordance with applicable trade regulations.

.2 Conform to latest MPI requirements for exterior repainting work including cleaning, preparation and priming.

.3 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, and solvents) to be in accordance with the latest edition of the MPI Approved Product List and to be from a single manufacturer for each system used.

.4 Paint materials such as linseed oil, shellac, and turpentine, to be the highest quality product of an approved manufacturer listed in MPI Maintenance Repainting Manual and shall be compatible with other coating materials as required.

.5 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Departmental Representative.

.6 Mock-ups:

.1 Provide a mock up in accordance with requirements of Section 01 45 00 Quality Control to Departmental Representative and Paint Inspection Agency.

.2 Prepare and repaint mock up designated exterior surface or item to requirements specified herein, with specified paint or coating showing selected colours, number of coats, gloss/sheen, textures and workmanship to MPI Maintenance Repainting Manual standards for review and approval.

.3 When approved, repainted surface and/or item shall become acceptable standard of finish quality and workmanship for similar on site exterior repainting work.

.7 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.8 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.9 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

.10 Surfaces preparation requiring painting shall be inspected by Departmental Representative or Independent testing agencies engaged by Departmental Representative, prior to commencing painting work,

1.5 WASTE MANAGEMENT AND DISPOSAL

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

1.6 RECOVERD BOLLARDS

.1 Bollards recovered from demolition work, once minor repairs carried out in accordance to Departmental Representative directives and Section 05 50 00 - Metal Fabrications, will receive a primary primer, two coats of paint and a main coat, all of vermilion red color.

.2 Presence of lead

.1 The finish coat of existing bollards to be subject to surface preparation and painting works may contain different percentage of lead. The Contractor shall take into account in its bid and comply with provincial legislation for the realization of painting works.

1.7 WORKS DESCRIPTION

.1 Bollards to be painted with 1 primer coat, 2 main coats and 1 finish coat, vermillion red colour.

.2 Contractor shall provide paint products to Departmental Representative for approval.

Part 2 Products

2.1 MATERIALS

.1 Paint

.1 Primer: marine application for steel, to MPI and CAN/CGSB 1.212- Heavy-Metal-Free Marine Primer for Steel and Light-Alloy Surfaces:

.1 Epoxy primer,

.2 Apply to coats to manufacturer's instructions.

.3 Primer for second coat: tinted sufficiently off finish colour of first coat to show where second coat is applied.

.4 Over and around bolts, rivets, sharp edges, welds, paint with paintbrush before second coat.

.2 Enamel main coat: MPI and CAN/CGSB 1.61 epoxy coating for marine application

.1 Apply 1 main coat to manufacturer’s instructions.

.2 Main coat to be compatible with primer coat and not affect life utility.

.3 Finish Coat

.1 Polyurethane type, MPI and CAN/CGSB 1.61 for marine application

.2 Apply 1 coat to manufacturer’s indications.

.4 Sand for sandblasting: to SSPC (Steel Structures Painting Council).

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 EXAMINATION

.1 Take appropriate action when removing blistered or rusted paint metal surfaces.

.2 Perform tests to detect the presence of lead paint.

.3 If traces of lead are found, stop work and notify Departmental Representative.

3.3 PREPARATION

.1 New metal surfaces

.1 Clean surfaces of new metal to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and foreign substances in accordance with the following:

.1 Solvent cleaning: SSPC-SP-1

.2 Near-White Metal Blast Cleaning: SSPC-SP10/NACE No. 2

.2 Exterior surfaces to be repainted

.1 Clean and prepare exterior surfaces by removing dust, dirt, dirt, oil, grease, foreign substances and surface debris by brushing, wiping with dry, clean clothes or compressed air.

.1 SSPC-SP 3 Power Tool Cleaning

.2 SSPC SP 6/NACE No. 3 Commercial Blast Cleaning

.3 SSPC-SP-1: Solvent cleaning

.3 Compressed air to be free of water and oil before reaching nozzle.

.4 Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes, by blowing with clean dry compressed air, or by vacuum cleaning.

.5 Do not apply paint until prepared surfaces have been accepted by Departmental Representative.

.6 Prior to commencing paint application the degree of cleanliness of surfaces to be in accordance with SSPC-Vis1.

.7 Contractor shall make sure that abrasive product and used procedures comply with environmental regulations and standards.

.8 Protection of surfaces

.1 Protect surfaces not to be painted and if damaged, clean and restore such surfaces as directed by Departmental Representative.

.2 Apply primer, main paint, finish paint or pre-treatment after surface has been cleaned and before deterioration of surface occurs.

.3 Clean surfaces again if rusting occurs after completion of surface preparation.

.4 Prevent contamination of cleaned surfaces by salts, acids, alkalis, corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats of paint. Remove contaminants from surface and apply paint immediately.

.5 Protect cleaned and freshly painted surfaces from dust to approval of Departmental Representative.

.9 Mixing paint

.1 Do not dilute or thin paint for brush application; use as received from manufacturer.

.2 Mix ingredients in container before and during use and ensure breaking up of lumps, complete dispersion of settled pigment, and uniform composition.

.3 Do not mix or keep paint in suspension by means of air bubbling through paint.

.4 Thin paint for spraying according to manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Departmental Representative.

.10 Number of paint coats

.1 Recovered bollards painting

.1 Paint materials for each coating formula to be products of a single manufacturer.

.2 Follow manufacturer’s instructions.

.3 Shop: apply 2 primer coats to minimum dry film thickness of 125 microns per coat or to manufacturer’s indications.

.4 Shop: apply 1 main alkyd enamel coat to minimum dry film thickness of 350 microns or to manufacturer’s indications.

.5 Shop: apply 1 finish coat of polyurethane or epoxy type paint to minimum dry film thickness of 50 microns or to manufacturer’s indications.

3.4 APPLICATION

.1 Apply paint by spraying, brushing, or combination of both. Use sheepskins or daubers when no other method is practical in places of difficult access.

.2 Use dipping or roller coating method of application when specifically authorized by Departmental Representative in writing.

.3 Caulk open seams at contact surfaces of built up members with material approved by Departmental Representative, before second undercoat of primer is applied.

.4 Where surface to be painted is not under cover, do not apply paint when:

.1 Air temperature is below 5 degrees C or when temperature is expected to drop to 0 degrees C before paint has dried.

.2 Temperature of surface is over 50 degrees C unless paint is specifically formulated for application at high temperatures.

.3 Fog or mist occurs at site; it is raining or snowing; there is danger of rain or snow; relative humidity is above 85%.

.4 Surface to be painted is wet, damp or frosted.

.5 Previous coat is not dry.

.5 Provide cover when paint must be applied in damp or cold weather. Protect, shelter, or heat surface and surrounding air to comply with temperature and humidity conditions specified in 3.3.4. Protect until paint is dry or until weather conditions are suitable.

.6 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.

.7 Apply each coat of paint as continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

.8 Brush application

.1 Work paint into cracks, crevices and corners and paint surfaces not accessible to brushes by spray, daubers or sheepskins.

.2 Brush out runs and sags.

.3 Remove runs, sags and brush marks from finished work and repaint.

.9 Spray application

.1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.

.2 Provide traps or separators to remove oil and water from compressed air and drain periodically during operations.

.3 Keep paint ingredients properly mixed in spray pots or containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.

.4 Apply paint in uniform layer, with overlapping at edges of spray pattern.

.5 Brush out immediately runs and sags.

.6 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray. In areas not accessible to spray gun, use brushes, daubers or sheepskins.

.7 Remove runs, sags and brush marks from finished work and repaint.

.10 Shop painting

.1 Do shop painting after fabrication and before damage to surface occurs from weather or other exposure.

.2 Spray paint contact surfaces of field assembled, bolted, friction type joints with primer coat only. Do not brush primer after spraying.

.3 Do not paint metal surfaces which are to be embedded in concrete.

.4 Paint metal surfaces to be in contact with wood with either full paint coats specified or three shop coats of specified primer.

.5 Do not paint metal within 50 mm of edge to be welded. Give unprotected steel one coat of boiled linseed oil or approved protective coating after shop fabrication is completed.

.6 Remove weld spatter before painting. Remove weld slag and flux by methods as specified in paragraph 3.2.1 New Metal Surfaces.

.7 Protect machine finished or similar surfaces that are not to be painted but that do require protection, with coating of rust inhibitive petroleum, molybdenum disulphide, or other coating approved by Departmental Representative.

.8 Copy previous erection marks and weight marks on areas that have been shop painted.

.11 Field painting

.1 Paint steel structures as soon as practical after erection.

.2 Touch up metal which has been shop coated with same type of paint and to same thickness as shop coat. This touch-up to include cleaning and painting of field connections, welds, rivets, nuts, washers, bolts, and damaged or defective paint and rusted areas.

.3 Field paint surfaces (other than joint contact surfaces) which are accessible before erection but which are not to be accessible after erection.

.4 Do not apply final coat of paint until concrete work is completed, except as directed by Departmental Representative. If concreting or other operations damage paint, clean and repaint damaged area. Remove concrete spatter and droppings before paint is applied.

.5 Where painting does not meet with requirements of specifications, and when so directed by Departmental Representative, remove defective paint, thoroughly clean affected surfaces and repaint in accordance with these specifications.

.12 Handling painted metal

.1 Do not handle painted metal until paint has dried, except for necessary handling for painting or stacking for drying.

.2 Scrape off and touch up paint which is damaged in handling, with same number of coats and kinds of paint as were previously applied to metal.

3.5 FIELD QUALITY CONTROL

.1 Independent Testing Agencies may be engaged and paid by Departmental Representative to evaluate procedures used, to inspect surface preparation and painting work.

.2 Site Tests, Inspections.

.1 Upon completion of the painting procedures test for dry film reading and evaluate the results as per SSPC-PA 2.

3.6 CLEANING

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CSA C22.1F09, Canadian Electrical Code, Part 1 (21th Edition), Safety Standard for Electrical Installations.

.2 CAN/CSA-C22.3 No. 1-01(Update March 2005), Overhead Systems.

.3 CAN3-C235-83(R2000), Preferred Voltage Levels for AC Systems, 0 to 50,000 V.

.2 Electrical and Electronic Manufacturer's Association of Canada (EEMAC)

.1 EEMAC 2Y-1, Light Gray Colour for Indoor Switch Gear

.3 Institute of Electrical and Electronics (IEEE)/National Electrical Safety Code Product Line (NESC)

.1 IEEE SP1122, the Authoritative Dictionary of IEEE Standards Terms, 7th Edition

1.2 DEFINITIONS

.1 Electrical and electronic terms: unless otherwise specified or indicated, terms used in these specifications, and on drawings, are those defined by IEEE SP1122.

1.3 DESIGN REQUIREMENTS

.1 Operating voltages: to CAN3-C235.

.2 Motors, electric heating, control and distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard.

.1 Equipment to operate in extreme operating conditions established in above standard without damage to equipment.

.3 Language operating requirements: provide identification nameplates and labels for control items in English and French.

.4 Use one nameplate or label for each language or both languages.

1.4 SUBMITTALS

.1 Shop drawings:

.1 Indicate of drawings clearances for operation, maintenance, and replacement of operating equipment devices.

.2 Submit 1 number of copies minimum size drawings to authority having jurisdiction.

.3 If changes are required, notify Departmental Representative of these changes before they are made.

.2 Quality Control: in accordance with Section 01 45 00 - Quality Control.

.1 Provide CSA certified equipment and material.

.2 Where CSA certified equipment and material is not available, submit such equipment and material to authority having jurisdiction for approval before delivery to site.

.3 Permits and fees: in accordance with General Conditions of contract.

1.5 QUALITY ASSURANCE

.1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.

.2 Qualifications: electrical Work to be carried out by qualified, licensed electricians who hold valid Master Electrical Contractor license or apprentices in accordance with authorities having jurisdiction as per the conditions of Provincial Act respecting manpower vocational training and qualification.

.1 Employees registered in provincial apprentices program: permitted, under direct supervision of qualified licensed electrician, to perform specific tasks.

.2 Permitted activities: determined based on training level attained and demonstration of ability to perform specific duties.

.3 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29- Health and Safety Requirements.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Material Delivery Schedule: provide Departmental Representative with schedule within 2 weeks after notice of acceptance of offer.

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

1.7 SYSTEM STARTUP

.1 Instruct Departmental Representative in operation, care and maintenance of systems, system equipment and components.

1.8 OPERATING INSTRUCTIONS

.1 Provide for each system and principal item of equipment as specified in technical sections for use by operation and maintenance personnel.

.2 Operating instructions to include following:

.1 Wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment.

.2 Start up, proper adjustment, operating, lubrication, and shutdown procedures.

.3 Safety precautions.

.4 Procedures to be followed in event of equipment failure.

.5 Other items of instruction as recommended by manufacturer of each system or item of equipment.

.3 Post instructions where directed.

.4 Ensure operating instructions will not fade when exposed to sunlight and are secured to prevent easy removal or peeling.

1.9 DELIVERY, INSTALLATION AND CONNECTION MATERIALS

.1 Except for material supplied by Departmental Representative and indicated in section 2.1.1 – Materials and Equipment, all drawings shown or mentioned in this specification are supplied, installed and connected by the contractor. Therefore, installation and connection of one or more materials, this implies that they are Contractor’s responsibility. Special cases where the supply and/or installation and/or connection to another contractor, are specifically mentioned.

.2 The only terms such as "provide", "supply", "install", "installation", "ask" or "installation" have the same meaning as the combination of the following text: supply, install, connect, test, configure, program, and put in operation.

.3 In addition to providing materials, provide labor and equipment necessary for the complete installation.

.4 All materials that are not specifically mentioned, but which are necessary to make complete systems and in accordance with the specifications must be supplied, installed and connected by the Contractor.

Part 2 Products

2.1 MATERIALS AND EQUIPMENT

.1 Equipment supplied by Departmental Representative is listed below:

Description	Quantity
Genilux Post CD6630H-250 / B6 / TN / GAL	15
Galvanized Double bracket Genilux, style 2	7
Galvanized Triple bracket Genilux, style 7	3
Galvanized Four bracket Genilux,, style 8	2
Measuring cabinet 900x900	1
Breaker 600V 400A with fuse 400A	1
Panel PP1,347/ 600V 400A 66CCTS (including 3 200A leads)	1
Breaker s 347V 20A 1P	29
Breaker 600V 200A 2P 200A	3
Breaker 600V 30A 3P	3
Breaker 347V 15A 1P	10
Breaker 600V 15A, 3P	1
Measuring cabinet with base 600V, 30A	3
Transformer 600V- 120/240V 100KVA with anti-vibration cushion	3
Panel (PS1,PS-2,PS-3) 120/240V, 600A 24CCTS (max 150A leads)	3
Breaker 240V 2P, 150A	10
Breaker 240V 2P, 60A	1
Breaker 120V 1P 15A	5
Measuring cabinet with base 240V, 150A	10
Panel PPS1 120/240V, 200A 16 CCTS	9
Breaker 240V 2P, 60A	18
Breaker 240V 2P, 30A	18
Breaker 120V 1P 20A	18
Panel PVC 24" width X 30" high X 8" deep (to insert PPS1)	9
Panel PPS2 120/240V, 100A 12 CCTS	5
Breaker 240V 2P, 60A	1
Breaker 240V 2P, 30A	8
Breaker 120V 1P 20A	10
Panel PVC 24" width X 30" high X 8" deep (to insert PPS2)	5
Housing interlock Pin & Sleeve 120/240V Hubbell 30A HBL430MI12W	26
Housing interlock Pin & Sleeve 120/240V Hubbell 60A HBL460MI12W	19
Housing plug duplex Hubbell (3099H and 3056H) with water tight 20A plug	28
Panel PP2 Square D 120V-240V, 400A, 24 CCTS	5
Breaker Square D 240V 2P 100A	4
Breaker Square D 120V 1P 20A	4
Junction box PVC 12"X12" X 8" for services station	12
AL-D / 60NB-136 / 5K /6x6 / 347 / SF3 / GYS	1
AL-D / 72NB-220 / 5K /2x2 / 347 / SF3 / GYS	2
AL-D / 72NB-220 / 5K /5x5 / 347 / SF3 / GYS	12
AL-D / 72NB-220 / 5K /6x6 / 347 / SF3 / GYS	2
AL-D / 60NB-136 / 5K /6x6 / 347 / SF3 / GYS	1
AL-D / 72NB-220 / 5K /4x4 / 347 / SF3 / GYS	7
AL-D / 72NB-220 / 5K /6x6 / 347 / SF3 / GYS	1
AL-D / 72NB-220 / 5K /4x4 / UNV / SF3 / GYS	4
AL-D / 72NB-220 / 5K /5x5 / UNV / SF3 / GYS	2
AL-D / 72NB-220 / 5K /6x6 / UNV / SF3 / GYS	1
AL-D / 72NB-220 / 5K /2x2 / UNV / SF3 / GYS	1

.2 Provide material and equipment in accordance with Section 01 61 00 - Common Product Requirements.

.3 Material and equipment to be CSA certified. Where CSA certified material and equipment are not available, obtain special approval from Departmental Representative before delivery to site and submit such approval as described in PART 1 - SUBMITTALS.

2.2 WIRING TERMINATIONS

.1 Ensure lugs, terminals, screws used for termination of wiring are suitable for either copper or aluminum conductors.

2.3 EQUIPMENT IDENTIFICATION

.1 Identify electrical equipment with [nameplates] [and] [labels] as follows:

.1 Nameplates: lamicoid 3 mm thick plastic engraving sheet melamine, black face, white core, lettering accurately aligned and engraved into core mechanically attached with self-tapping screws.

.2 Sizes as follows:

NAMEPLATE SIZES

Size 1	10 x 50 mm	1 line	3 mm high letters
Size 2	12 x 70 mm	1 line	5 mm high letters
Size 3	12 x 70 mm	2 lines	3 mm high letters
Size 4	20 x 90 mm	1 line	8 mm high letters
Size 5	20 x 90 mm	2 lines	5 mm high letters
Size 6	25 x 100 mm	1 line	12 mm high letters
Size 7	25 x 100 mm	2 lines	6 mm high letters

.2 Labels: embossed plastic labels with 6mm high letters unless specified otherwise.

.3 Wording on nameplates and labels to be approved by Departmental Representative prior to manufacture.

.4 Nameplates for terminal cabinets and junction boxes to indicate system and/or voltage characteristics.

.5 Identify equipment with Size 3 labels engraved "ASSET INVENTORY NO." as directed by Departmental Representative.

.6 Disconnects, starters and contactors: indicate equipment being controlled and voltage.

.7 Terminal cabinets and pull boxes: indicate system and voltage.

2.4 WIRING IDENTIFICATION

.1 Identify wiring with permanent indelible identifying markings, numbered or coloured plastic tapes, on both ends of phase conductors of feeders and branch circuit wiring.

.2 Maintain phase sequence and colour coding throughout.

.3 Colour coding: to CSA C22.1.

2.5 FINISHES

.1 Shop finish metal enclosure surfaces by application of rust resistant primer inside and outside, and at least two coats of finish enamel.

Part 3 Execution

3.1 INSTALLATION

.1 Do complete installation in accordance with CSA C22.1 except where specified otherwise.

.2 Do overhead and underground systems in accordance with CSA C22.3 No.1 except where specified otherwise.

3.2 NAMEPLATES AND LABELS

.1 Ensure manufacturer's nameplates, CSA labels and identification nameplates are visible and legible after equipment is installed.

3.3 CONDUIT AND CABLE INSTALLATION

.1 Install cables, conduits and fittings embedded or plastered over, close to building structure so furring can be kept to minimum.

3.4 MOUNTING HEIGHTS

.1 Mounting height of equipment is from ground unless specified or indicated otherwise.

.2 If mounting height of equipment is not specified or indicated, verify before proceeding with installation.

.3 Install lighting fixtures at following heights unless indicated otherwise.

.1 lighting fixtures: 8.8 m.

3.5 CO-ORDINATION OF PROTECTIVE DEVICES

.1 Ensure circuit protective devices such as overcurrent trips, relays and fuses are installed to required values and settings.

3.6 FIELD QUALITY CONTROL

.1 Conduct following tests in accordance with Section 01 45 00 - Quality Control.

.1 Lighting and its control.

.2 Electrical outlet

.2 Carry out tests in presence of Departmental Representative.

.3 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.

3.7 CLEANING

.1 Clean and touch up surfaces of shop-painted equipment scratched or marred during shipment or installation, to match original paint.

.2 Clean and prime exposed non-galvanized hangers, racks and fastenings to prevent rusting.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 03 30 00 - Cast-in-Place concrete

.3 Section 31 23 10 - Excavating, trenching and backfilling

.4 Section 32 11 19 - Granular Sub-base

1.2 REFERENCES

.1 Government of Quebec, Department of Transports

.1 Cahier des charges et devis généraux (CCDG)

.2 American Society for Testing and Materials (ASTM)

.1 ASTM D4791-05, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate

1.3 SAMPLES

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

.2 Allow continual sampling by Departmental Representative during production.

.3 Provide Departmental Representative with access to source and processed material for sampling.

.4 Pay cost of sampling and testing of aggregates which fail to meet specified requirements.

.5 Provide water, electric power and propane to Departmental Representative laboratory trailer at production site.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Divert unused granular materials from landfill to local quarry as approved by Departmental Representative.

Part 2 Products

2.1 MATERIALS

.1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, or other substances that would act in deleterious manner for use intended.

.2 Flat and elongated particles of coarse aggregate: to ASTM D4791.

.1 Greatest dimension to exceed five (5) times least dimension.

.3 Fine aggregates satisfying requirements of applicable section to be one, or blend of following:

.1 Natural sand.

.2 Manufactured sand.

.3 Screenings produced in crushing of quarried rock, boulders, gravel or slag.

.4 Coarse aggregates satisfying requirements of applicable section to be one of or blend of following:

.1 Crushed rock.

.2 Gravel or crushed gravel composed of naturally formed particles of stone.

2.2 SOURCE QUALITY CONTROL

.1 Inform Departmental Representative of proposed source of aggregates and provide access for sampling at least 3 weeks prior to commencing production.

.2 If, in opinion of Departmental Representative, materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate an alternative source or demonstrate that material from source in question can be processed to meet specified requirements.

.3 Advise Departmental Representative 2 weeks in advance of proposed change of material source.

.4 Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

Part 3 Execution

3.1 PREPARATION

.1 Aggregate source preparation

.1 Prior to excavating materials for aggregate production, clear and grub area to be worked, and strip unsuitable surface materials. Dispose of cleared, grubbed and unsuitable materials as directed by Departmental Representative.

.2 Where clearing is required, leave screen of trees between cleared area and roadways as directed.

.3 Clear, grub and strip area ahead of quarrying or excavating operation sufficient to prevent contamination of aggregate by deleterious materials.

.4 When excavation is completed, dress sides of excavation to nominal 1.5:1 slope, and provide drains or ditches as required to prevent surface standing water.

.5 Trim off and dress slopes of waste material piles and leave site in neat condition.

.2 Processing

.1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.

.2 Blend aggregates, if required, to obtain gradation requirements, percentage of crushed particles, or particle shapes, as specified. Use methods and equipment approved by Departmental Representative.

.3 Wash aggregates, if required to meet specifications. Use only equipment approved by Departmental Representative.

.4 When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate.

.3 Handling

.1 Handle and transport aggregates to avoid segregation, contamination and degradation.

.4 Stockpiling

.1 Stockpile aggregates on site in locations as indicated unless directed otherwise by Departmental Representative. Do not stockpile on completed pavement surfaces.

.2 Stockpile aggregates in sufficient quantities to meet Project schedules.

.3 Stockpiling sites to be levelled, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.

.4 Except where stockpiled on acceptably stabilized areas, provide compacted sand base not less than 300 mm in depth to prevent contamination of aggregate. Stockpile aggregates on ground but do not incorporate bottom 300 mm of pile into Work.

.5 Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.

.6 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by Departmental Representative within 48 h of rejection.

.7 Stockpile materials in uniform layers of thickness not exceeding 1.5 meter.

.8 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.

.9 Do not cone piles or spill material over edges of piles.

.10 Do not use conveying stackers.

.11 During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

3.2 CLEANING

.1 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.

.2 Leave any unused aggregates in neat compact stockpiles as directed by Departmental Representative.

.3 For temporary or permanent abandonment of aggregate source, restore source to condition meeting requirements of authority having jurisdiction.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 01 35 29 - Health and Safety Requirements

.3 Section 01 35 43 - Environmental Procedures

.4 Section 01 56 00 - Temporary Barriers and Enclosures

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

.6 Section 31 32 19 - Geotextiles

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM C117, Standard Test Method for Material Finer Than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.

.2 ASTM C 127, Standard Test Method for Specific Gravity and Absorption of Coarse Aggregate.

.3 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.4 ASTM C 535, Standard Test Method for Resistance to Degradation of Large Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

.5 ASTM D422, Standard Test Method for Particle-Size Analysis of Soils.

.6 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ;) (600 kN-m/m ;).

.7 ASTM D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft ^{3}) (2,700 kN-m/m ^{3}).

.8 ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

.2 U.S. Environmental Protection Agency (EPA)/Office of Water

.1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

.3 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.2-M, Sieves, Testing, Woven Wire, Metric.

.4 Canadian Standards Association (CSA International)

.1 CAN/CSA-A3000, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

.1 CSA-A3001, Cementitious Materials for Use in Concrete.

.2 CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.5 Department of Justice Canada (Jus)

.1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.

.2 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

.6 Government of Québec, Ministère des Transports

.1 Cahier des charges et devis généraux (CCDG).

1.3 DEFINITIONS

.1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.

.1 Rock: solid material in excess of 1.00 cubic meter; and which cannot be removed by means of heavy duty mechanical excavating equipment. Frozen material not classified as rock.

.2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.

.2 Waste material: excavated material unsuitable for use in Work or surplus to requirements.

.3 Unsuitable materials:

.1 Weak, chemically unstable, and compressible materials.

.2 Frost susceptible materials:

.1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422 and ASTM C136: Sieve sizes to CAN/CGSB-8.2.

.2 Table:

Sieve Designation	% Passing
2.00 mm	100
0.10 mm	45 - 100
0.02 mm	10 - 80
0.005 mm	0 - 45

.3 Coarse-grained soils containing more than 20 % by mass passing 0.075 mm sieve.

.4 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.

.5 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.

.6 Unshrinkable fill: very weak mixture of cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

1.4 SUBMITTALS

.1 Make submittals in accordance with Section 1 33 00 - Submittal Procedures.

.2 Quality Control: in accordance with Section 01 45 00 - Quality Control

.1 Submit condition survey of existing conditions as described in EXISTING CONDITIONS article of this Section.

.2 Submit for review by Departmental Representative proposed dewatering and heave prevention methods as described in PART 3 of this Section.

.3 Submit to Departmental Representative written notice at least 7 days prior to excavation work, to ensure cross sections are taken.

.4 Submit to Departmental Representative written notice when bottom of excavation is reached.

.5 Submit to Departmental Representative results and report as described in PART 3 of this Section.

.3 Preconstruction Submittals:

.1 Submit construction method and equipment list for major equipment to be used in this section prior to start of Work.

.4 Samples:

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

.2 At least 4 weeks prior to beginning Work, inform Departmental Representative of material source and provide access for sampling.

1.5 QUALITY ASSURANCE

.1 Engage services of qualified professional engineer who is registered or licensed in Province of Quebec, Canada in which Work is to be carried out to design and inspect cofferdams, shoring, bracing and underpinning required for Work.

.2 Do not use soil material until written report of soil test results are reviewed and [approved] by Departmental Representative.

1.6 WASTE MANAGEMENT AND DISPOSAL

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

.2 Place materials defined as hazardous or toxic in designated containers.

.3 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.

.4 Divert excess aggregate materials from landfill to local quarry or recycling facility for reuse as directed by Departmental Representative.

1.7 EXISTING CONDITIONS

.1 Buried services:

.1 Before commencing work verify and establish location of buried services on and adjacent to site.

.2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.

.3 Remove obsolete buried services within 2 m of foundations: cap cut-offs.

.4 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.

.5 Prior to beginning excavation Work, notify Departmental Representative and authorities having jurisdiction of location and state of use of buried utilities and structures. Departmental Representative and authorities having jurisdiction to clearly mark such locations to prevent disturbance during Work.

.6 Confirm locations of buried utilities by careful test excavations.

.7 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered as indicated.

.8 Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representative before removing or re-routing. Costs for such Work to be paid by Departmental Representative.

.9 Record location of maintained, re-routed and abandoned underground lines.

.10 Confirm locations of recent excavations adjacent to area of excavation.

.2 Existing structures protection:

.1 Conduct, with Departmental Representative, condition survey of existing structures which may be affected by Work.

.2 Protect existing buildings and other surface structures from damage while Work is in progress. In event of damage, immediately make repair as directed by Departmental Representative.

.3 Protect existing features in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and applicable local regulations.

Part 2 Products

2.1 MATERIALS

.1 Hard, durable, abrasion-resistant material which will not disintegrate under wave action or wet-dry, freeze-thaw cycles, wet dry cycle and to Departmental Representative.

.1 Relative density (formerly specific gravity): not less than 2 600 kg/m3, to ASTM C 127.

.2 Absorption: maximum of 2.0%, to ASTM C 127.

.3 Test of aggregate degradation in a magnesium sulfate solution (MgSO4): maximum loss of 10% after 7 cycles to BNQ 2560-450.

.2 Fill material: properties to Section 31 05 17 - Aggregate Materials and section 32 11 19 – Granular sub-base and the following requirements:

.1 Crushed, pit run or screened stone, gravel or sand.

.2 Gradations within limits specified when tested to ASTM C117, ASTM C136. Sieve sizes to CAN/CGSB-8.2 and Cahier des charges et devis généraux (CCDG) from Government of Quebec.

.3 Quarry-Run 300-0 mm

Sieve Designation	% Passing		
	Type 1	Type 2	Quarry-run (sieved)
300 mm	-	-	80 - 90
250 mm	-	-	-
150 mm	-	-	40 - 60
75 mm	-	100	-
50 mm	-	-	10 - 25
37.5 mm	-	-	-
25 mm	100	-	-
19 mm	75 - 100	-	-
12.5 mm	-	-	5 -15
9.5 mm	50 - 100	-	-
4.75 mm	30 - 70	22 - 85	-
2.00 mm	20 - 45	-	-
0.425 mm	10 - 25	5 - 30	-
0.180 mm	-	-	-
0.075 mm	3 - 8	0 - 10	-

.3 Type 3 fill: selected material from excavation or other sources, approved by Departmental Representative for use intended, unfrozen and free from rocks larger than 75 mm, cinders, ashes, sods, refuse or other deleterious materials.

.4 Class A aggregate material: clean sand.

.5 The crushed concrete recovered from the demolition of the existing wharves may be used as run material, after reinforcement has been removed and as long as the largest pieces are less than 300 mm, for stone protection.

.6 Granular materials recovered from the demolition of wharves may be used as run material or stone protection along wharf, as specified in the plans and to the satisfaction of the Departmental Representative. The recovered rock fill may also serve as fill material if it meets the size requirements set out in the specifications.

.7 Geotextiles: to Section 31 32 19 - Geotextiles.

Part 3 Execution

3.1 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 and walkways, according to requirements of authorities having jurisdiction and sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 SITE PREPARATION

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

.2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.

3.3 PREPARATION/PROTECTION

.1 Protect existing features in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and applicable local regulations.

.2 Keep excavations clean, free of standing water, and loose soil.

.3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative approval.

.4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.

.5 Protect buried services that are required to remain undisturbed.

3.4 STOCKPILING

.1 Stockpile fill materials in areas designated by Departmental Representative

.2 Stockpile fill materials in manner to prevent segregation.

.3 Protect fill materials from contamination.

.4 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

3.5 COFFERDAMS, SHORING, BRACING AND UNDERPINNING

.1 Maintain sides and slopes of excavations in safe condition by appropriate methods and in accordance with Section 01 35 29 - Health and Safety Requirements and Health and Safety Act for the Province of Quebec.

.1 Where conditions are unstable, Departmental Representative has to verify and advise methods. Contractor is responsible for methods to protect and maintain in same condition structures to preserve.

.2 If required, Construct temporary Works to depths, heights and locations as indicated or directed by Departmental Representative.

.3 During backfill operation:

.1 Unless otherwise indicated or directed by Departmental Representative, remove sheeting and shoring from excavations.

.2 Pull sheeting in increments that will ensure compacted backfill is maintained.

3.6 DEWATERING AND HEAVE PREVENTION

.1 Keep excavations free of water while Work is in progress.

.2 Provide for Departmental Representative's review details of proposed dewatering or heave prevention methods.

.3 Avoid excavation below groundwater table if quick condition or heave is likely to occur.

.1 Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.

.4 Protect open excavations against flooding and damage due to surface run-off.

.5 Dispose of water in accordance with Section 01 35 43 - Environmental Procedures in manner not detrimental to public and private property, or portion of Work completed or under construction.

.1 Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.

.6 Provide flocculation tanks, settling basins, or other facilities to remove suspended solids or other materials before discharging to storm sewers, watercourses or drainage areas.

3.7 EXCAVATION

.1 Advise Departmental Representative at least 7 days in advance of excavation operations for initial cross sections to be taken.

.2 Excavate to lines, grades, elevations and dimensions as indicated.

.3 Make saw cuts to delineate the excavation trenches.

.4 Remove concrete, paving and other obstructions encountered during excavation in accordance with Section 02 41 16 – Structure demolition.

.5 Excavation must not interfere with bearing capacity of adjacent foundations.

.6 For trench excavation, unless Departmental Representative has given his written authorization, do not excavate more than 30 m of trench before proceeding to the installation of the elements to burry, and do not leave open more than 15 m at the end of a work day.

.7 Keep excavated and stockpiled materials at a safe distance away from edge of trench as directed by Departmental Representative.

.8 Restrict vehicle operations directly adjacent to open trenches.

.9 Dispose of surplus and unsuitable excavated material off site.

.10 Do not obstruct flow of surface drainage or natural watercourses.

.11 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.

.12 Notify Departmental Representative when bottom of excavation is reached.

.13 Obtain Departmental Representative’s approval for completed excavations.

.14 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Departmental Representative.

.15 Correct unauthorized over-excavation as follows:

.1 Use unshrinkable fill under supporting surfaces.

.2 Fill under bearing surfaces and footings with fill approved by Departmental Representative compacted not less than 95 % of corrected Standard Proctor maximum dry density.

.16 Hand trim, make firm and remove loose material and debris from excavations.

.1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.

.17 Install geotextiles in accordance with Section 31 32 21 - Geotextiles.

3.8 FILL TYPES AND COMPACTION

.1 Use fill materials as indicated. Compaction densities are not less than 95% of maximum densities obtained from corrected maximum dry density or as indicated on plan.

3.9 BEDDING AND SURROUND OF UNDERGROUND SERVICES

.1 Place and compact granular material for bedding and surround of underground services as indicated and as specified by Departmental Representative or authority having jurisdiction.

.2 Place bedding and surround material in unfrozen condition.

3.10 BACKFILLING

.1 Do not proceed with backfilling operations until completion of following:

.1 Departmental Representative has inspected and approved installations.

.2 Departmental Representative has inspected and approved of construction below finish grade.

.3 Inspection, testing, approval, and recording location of underground utilities.

.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 150 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 24 hours after placing of concrete.

.3 Place layers simultaneously on both sides of installed Work to equalize loading.

.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 Departmental Representative.

.2 If approved by Departmental Representative, erect bracing or shoring to counteract unbalance, and leave in place until removal is approved by Departmental Representative.

.6 Place fill with reused materials in areas as indicated.

3.11 RESTORATION

.1 Upon completion of Work, remove waste materials and debris in accordance to Section 01 74 21 - Construction/Demolition Waste Management and Disposal, trim slopes, and correct defects as directed by Departmental Representative.

.2 Reinstate pavements disturbed by excavation to thickness, structure and elevation which existed before excavation.

.3 Clean and reinstate areas affected by Work as directed by Departmental Representative.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Materials and installation of polymeric geotextiles used in revetments, breakwaters, retaining wall structures, filtration, drainage structures, roadbeds and railroad beds purpose of which is to:

- .1 Separate and prevent mixing of granular materials of different grading.
- .2 Act as hydraulic filters permitting passage of water while retaining soil strength of granular structure.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 01 74 21 - Construction/Demolition Waste Management And Disposal

.3 Section 31 23 33 – Excavating, trenching and backfilling

.4 Section 35 31 23 – Rubble Mound Breakwater

1.3 MEASUREMENT AND PAYMENT

.1 Supply and installation of geotextiles are part of the Works but will not be measured for payment.

1.4 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)

- .1 ASTM D4491, Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
- .2 ASTM D4595, Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
- .3 ASTM D4716, Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
- .4 ASTM D4751, 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-M, Textile Test Methods - Bursting Strength - Ball Burst Test.
- .2 CAN/CGSB-148.1, Methods of Testing Geotextiles and Complete Geomembranes.
  - .1 No.2-M, Methods of Testing Geosynthetics - Mass per Unit Area.
  - .2 No.3-M, Methods of Testing Geosynthetics - Thickness of Geotextiles.
  - .3 No.6.1, Methods of Testing Geotextiles and Geomembranes - Bursting Strength of Geotextiles Under No Compressive Load.

.4 No.7.3, Methods of Testing Geotextiles and Geomembranes - Grab Tensile Test for Geotextiles.

.5 No. 10, Methods of Testing Geosynthetics - Geotextiles - Filtration Opening Size.

.3 Canadian Standards Association (CSA International)

.1 CAN/CSA-G40.20/G40.21-[98], General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 CAN/CSA-G164-[M92(R1998)], Hot Dip Galvanizing of Irregularly Shaped Articles.

1.5 SUBMITTALS

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

.2 Submit to Departmental Representative following samples at least 2 weeks prior to beginning Work.

.1 At least 300 x 300 mm of geotextile.

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 WASTE MANAGEMENT AND DISPOSAL

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

Part 2 Products

2.1 MATERIAL

.1 Geotextile: non-woven synthetic fibre fabric, supplied in rolls.

.1 Composed of: minimum 85% by mass of polypropylene.

.2 Physical properties:

.1 Thickness: to CAN/CGSB-148.1, No.3, minimum 2.5 mm.

.2 Tensile strength and elongation (in any principal direction): to CAN/CGSB-148-1 No.7.3.

.1 Tensile strength: minimum 1 000 N, wet condition.

.2 Elongation at break: 70-110 %

.3 Bursting strength: to CAN/CGSB-148.1, No.6.1 minimum 2 600 kPa, wet condition.

.3 Hydraulic properties:

.1 Filtration opening size (FOS): to CAN/CGSB-148.1 No.10, 55 to 105 micrometers.

.4 Securing pins and washers: to CAN/CSA-G40.21, Grade 300W, hot-dipped galvanized with minimum zinc coating of 600 g/m^2.

.5 Factory seams: sewn in accordance with manufacturer's recommendations.

.6 Thread for sewn seams: equal or better resistance to chemical and biological degradation than geotextile.

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.

.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 Overlap each successive strip of geotextile 600 mm over previously laid strip above water level and 1 000 below water level.

.5 Pin successive strips of geotextile with securing pins.

.6 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material layers.

.7 After installation, cover with overlying layer within 24 hours of placement.

.8 Replace damaged or deteriorated geotextile to approval of Departmental Representative.

.9 Place and compact soil layers in accordance with Section 31 23 33– Excavating, Trenching and Backfilling and section 32 11 19 – Granular Sub-Base.

3.2 CLEANING

.1 Remove construction debris from Project site and dispose of debris in an environmentally responsible and legal manner.

3.3 PROTECTION

.1 Vehicular traffic not permitted directly on geotextile.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Materials and installation of polymeric geogrids used in revetments, breakwaters, retaining structures, embankments, roadbeds and railroad beds as reinforcement to provide tensile strength to soil mass.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

.3 Section 31 23 33 - Excavating, Trenching and Backfilling.

1.3 MEASUREMENT AND PAYMENT

.1 Supply and installation of geogrid are part of the Works but will not be measured for payment.

1.4 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)

.1 ASTM D1248, Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable.

.2 ASTM D4101, Standard Specification for Polypropylene Injection and Extrusion Materials.

.3 ASTM D4218-R2001, Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds By the Muffle-Furnace Technique.

.4 ASTM D5262, Standard Test Method for Evaluating the Unconfined Tension Creep Behaviour of Geosynthetics.

.5 ASTM D6637, Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method.

.2 Drexel University - Geosynthetic Research Institute (GRI)

.1 GRI GG2-R2000, Geogrid Junction Strength.

1.5 SUBMITTALS

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

.2 Submit to Departmental Representative the following samples at least 4 weeks prior to beginning Work.

.1 3 m length from full roll width of geogrid material.

.3 Submit to Departmental Representative copies of mill test data and certificate, at least 4 weeks prior to start of Work and in accordance with Section 01 33 00 - Submittal Procedures.

1.6 DELIVERY, STORAGE AND HANDLING

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

1.7 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 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

.4 Fold up metal banding, flatten and place in designated area for recycling.

Part 2 Products

2.1 MATERIAL

.1 Geogrid: open grid polymer having biaxial orientation, free of striations, roughness, pinholes, blisters, undispersed raw materials or any sign of contamination by foreign matter.

- .1 Roll width: 3 m minimum.
- .2 Roll length: 50 m minimum.
- .3 Aperture size: 40 mm
- .4 Polymer: polypropylene: to ASTM D4101with inhibitors added to resist deterioration by ultra-violet and heat exposure.

.2 Geogrid physical properties:

- .1 Ultimate tensile strength: 16 kN/m to ASTM D6637.
- .2 Tensile secant modulus at 2% elongation: to ASTM D6637, minimum 7 N/mm.
- .3 Rigid geogrid junction efficiency: to GRI GG2.
  - .1 Efficiency: minimum 93 %.

Part 3 Execution

3.1 INSTALLATION

.1 Grade area to be covered with geotextile to a uniform surface.

.2 Fill depressions with appropriate materials.

.3 Place filter fabric on prepared surface loosely allowing fabric to conform easily to the contours.

.4 This work will be completed by equipment working on the side of the containment cells.

.5 Place geogrid material by unrolling onto graded surface in manner and locations indicated and retain in position in accordance with manufacturer's written recommendations.

.6 Place geogrid on sloping surfaces in one continuous length from toe of slope to upper extent of geogrid.

.7 Overlap each successive strip of geogrid 600 mm over previously laid strip.

.8 Join successive strips of geogrid as recommended by manufacturer.

.9 Protect geogrid from displacement, damage or deterioration before and during placement of overlay soil layers.

.10 After installation, cover with material within 10 days of placement.

.11 Replace damaged or deteriorated geogrid to approval of Departmental Representative.

.12 Place and compact material layers in accordance with Section 31 23 33-Excavating Trenching and Backfilling.

3.2 CLEANING

.1 Remove construction debris from Project site and dispose of debris in an environmentally responsible and legal manner.

3.3 PROTECTION

.1 Vehicular traffic not permitted directly on geogrid.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 This section specifies requirements for the site work preparation of harbour dredging and disposal of dredged materials in geotextile containment upon completion of dredging.

.2 Site Work preparation will consist of, but not necessarily be limited to, the following:

.1 Grading of the site to meet geotextile containment specifications.

.2 Construction or modifications of site to control water.

.3 Site security, barricades and signage.

.4 Final grading of material on top of geotextile containers

1.2 RELATED SECTIONS

.1 Section 31 32 19 - Geotextiles

.2 Section 31 32 20 - Geogrid soil stabilization

.3 Section 35 21 18 – Dredging and excavation

1.3 TERMINOLOGY

.1 Geotextile Container: a large tube greater than 7.5 ft. (2.3 m) in circumference fabricated from high strength engineered textiles in lengths greater than 20 ft. (6.1 m). Geotextile containers are used for containment and dewatering of high moisture content sludge and other fine grain material.

.2 The Filling Port, also known as "Injection Port", are PVC flanges which the inner port body and outer port body each comprise one or more cellular surfaces capable of distributing a force caused by the clamping of the two bodies together. Once bolted to the top of the geotextile container, the dredge or pump discharge line can be attached. Ports are typically 100mm to 300mm in diameter with a 1.0 to 1.5 metre long flexible sleeve. Ports are spaced along the top of the tube to provide access by the contractor. Spacing is usually between 15 and 25 metres. Additional ports may be added to accommodate high content sand slurry dredged or pumped materials

.3 Specially Engineered Dewatering Textile: a woven synthetic textile used to construct the geotextile container.

.4 Polymers: Polyacrylamide polymers can be non-ionic, anionic, or cationic.

.5 Polymer Systems: the components of the dry or emulsion system shall include as a minimum: polymer storage, metering pump, static mixer, calibration cylinder, flow control valve, and piping as required.

.6 Flow, Percent Solids, and Density Measurement: a flow meter and a density meter are required in order to pace the polymer with the pumping rate and the solids in the line. Ideally they should be paced electronically with the polymer system.

.7 Bench-Scale – Geotextile Rapid Dewatering Test (RDT) is a fast and easy test to determine how well sludge dewaters through the textile. The test is designed to: evaluate the efficiency of the polymer, measure the volume of effluent filtered from the sludge, record the time of filtration, and analyze the quality of the effluent water.

.8 Geotextile Dewatering Test (GDT) is a demonstration of the methodology of the sludge dewatering by means of a Geotextile container. The purpose of the test is to: visualize the dewatering methodology, evaluate the efficiency of the selected polymer, analyze the clarity and quality of the effluent, and indicate achievable percent solids. Contact your local Geotextile representative for assistance in conducting this test.

1.4 GENERAL

.1 The Contractor must retain the services of a specialized firm in decontamination using geotextile containers technology with the use of chemical additives for flocculants.

.2 Submit to Departmental Representative a geotextile containers work plan.

.3 The Contractor shall furnish all labour, materials, equipment, polymer, and polymer deployment, and filling of the geotextile container, in accordance with the lines, grades, design, and dimensions shown on the drawings as specified herein.

.4 The Contractor shall furnish the geotextile container by positioning it on a prepared surface that meets manufacturer's specifications. The geotextile container is to be filled with dredged or pumped material to a height not to exceed the manufacturer's specifications.

.5 All geotextile containers and ancillary products shall be a standard product of a manufacturer who has been regularly engaged in the integral design, manufacture, and fabrication of a geotextile container, and whose product has proven reliable in similar service. The geotextile container manufacturer must have an on-site company representative lab that has a current A2LA certification.

.6 The use of polyacrylamide polymers to as a flocculent is as per the recommendation of the manufacturer of the geotextile containment bag. Some sediment loss is acceptable during filling; however, the loss cannot compromise adjacent water quality or access to the breakwater.

1.5 MEASUREMENT AND PAYMENT

.1 Measurement for payment will be a lump sum for all the geotextile containment bags properly deployed and filled with dredged materials.

.2 In order to guide the Contractor in the quantities preparation of his tender, the Department Representative estimates the quantities of contaminated sediments from exclusion zones to approximately 4 500 cubic metres in place measurement.

.3 Included in the lump sum price will be delivery and set up of the bags, including installation of impermeable liners, drainage layers, flanges, etc. as well as the cost of on-site manufacturer’s representatives and specialized firm and chemical additives for flocculants.

1.6 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)

- .1 ASTM D1248, Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable.
- .2 ASTM D4101, Standard Specification for Polypropylene Injection and Extrusion Materials.
- .3 ASTM D4218-R2001, Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds By the Muffle-Furnace Technique.
- .4 ASTM D5262, Standard Test Method for Evaluating the Unconfined Tension Creep Behaviour of Geosynthetics.
- .5 ASTM D6637, Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method.

.2 Drexel University - Geosynthetic Research Institute (GRI)

- .1 GRI GG2-R2000, Geogrid Junction Strength.

1.7 SUBMITTALS

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

.2 Submit to Departmental Representative copies of mill test data and certificate, at least 2 weeks prior to start of Work and in accordance with Section 01 33 00 - Submittal Procedures.

.3 Submit shop drawings indicating materials, equipment and the installation method to use for the whole system.

.4 Submit manufacturer's product literature and specifications for material(s) utilized to construct geotextile containers, including filling port details, connection details, site layout, piping, manifold, and related components

.5 Provide a mass balance of the pumping flow rates, chemical make-down, amount of dilution water, filtrate volume, density measurement, and percent solids - all integrated into a real time control system, showing a method of collection, and discharge point.

.6 Details and layout of the dry or emulsion polymer make-down and metering system.

1.8 DELIVERY, STORAGE AND HANDLING

.1 Geotextile container and related components shall be delivered to the project site in a protective wrap or cover. Each tube shall be clearly labeled for easy identification. All geotextile containers greater than 1,000 lbs. gross weight or installed in the wet shall be rolled on a steel pipe and the ends fitted with PVC protective caps.

.2 No hooks, tongs, or other sharp instruments shall be used for handling geotextile containers. Also, the container should not be dragged along the ground.

.3 Geotextile containers should be unrolled into position as recommended by the manufacturer. Geotextile containers shall be stored in areas where water cannot accumulate, elevated off of the ground, and protected from conditions that will affect the

proper ties or performance of the container. Geo-textile containers should not be exposed to

1.9 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 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

.4 Fold up metal banding, flatten and place in designated area for recycling.

Part 2 Products

2.1 MATERIAL

.1 The Geotextile container

.1 The Geotextile container shall be fabricated from specially engineered dewatering textiles manufactured from high tenacity polypropylene multifilament and monofilament yarns, which are woven into a stable network such that the yarns retain their relative position. The Geotextile container material shall be inert to biological degradation and resistant to naturally encountered chemicals, alkalis, and acids.

.2 Fabric is to be designed for containment only. No loading or traffic is proposed on containment bags.

.3 The Geotextile container shall be fabricated by sewing together mill widths of the woven engineered textile to form a tubular shape. The seams shall be parallel stitch with multi-ply polyester filament yarn.

.4 Geotextile containers fabricated 14m or greater in circumference are fabricated with the mill roll length of the woven engineered textile and the adjacent seams being in the circumferential direction with the closure of the geotextile container having a longitudinal seam on the bottom of the container. Each geotextile container shall be fabricated with one or more PVC filling ports located along the top centerline of the Geotextile container.

.5 The filling port is comprised of 38mm thick inside and outside flange rings that sandwiches the woven engineered textile surface between 3mm thick rubber gaskets and secured with 19mm bolts, or to create a connection that exceeds the strength of a traditional sewn seam. The fill port is to include a fabric sleeve that clamps around the feed line to prevent leakage.

.6 PVC Fill Ports are for the attachment of the dredge or pump discharge line to the geotextile container shall be located at intervals of no more than 30 m, or as recommended by the manufacturer. Fill ports shall be ridged PVC with an inner port body and o outer port body each comprising one or more cellular surfaces capable of distributing a force caused by the clamping of the inner port body and outer port body together with steel bolts and nuts.

.2 Drainage Layer

.1 Stone size: 35 mm.

Part 3 Execution

3.1 INSTALLATION

.1 Prior to performing any work, the contractor shall submit a plan describing the sequences of operations for the installation of the geotextile container. The plan shall address site preparation, deployment, chemical/polymer selection, mixing, injection, and filling of the tubes, and anchoring or securing methods. Equipment used for these operations shall also be outlined.

.2 Areas in which geotextile containers are to be placed shall be constructed according to the fines and grades shown on the drawings. Where such areas are below the allowable grades, they shall be brought to grade. All obstructions that could damage the Geotextile containers, such as roots and projecting stones, shall be removed.

.3 Generally, the site surface is to be designed with a level grade 0° slope across the width of the container and a maximum slope 1% for the first 30m and not to exceed 0.5% in the overall length direction of the Geotextile container.

.4 A drainage system such as an aggregate system or three-dimensional filtration fabric is required underside of the geotextile bags.

.5 Impervious membrane placed on the prepared surface to underlay the entire geotextile dewatering site and to cover the perimeter containment berms.

.6 On top of the impervious membrane and under the geotextile containers and when stacking geotextile containers, a drainage medium shall be required as described in paragraph above. Acceptable materials would be three-dimensional filtration fabric (geotextile filtration fabric (GFF)) or a minimum of 100mm of 30mm washed free draining aggregate. Installed GFF or wash aggregate prior to placement of the geotextile container between each of geotextile container when stacking.

.7 Place the Geotextile containers within the limits as shown on the Drawings.

.8 The unrolled Geotextile container to be placed on top of the drainage media and be unrolled down the length direction of the dewatering site and unfolded.

.9 Fill ports to be on the top and down the centerline of the unrolled Geotextile container. The dimensions of the feed pipe and the opening of the ports should be measured prior to connecting the flanges.

.10 The dredge discharge pipe shall be free of protrusions that could tear the Geotextile surface.

.11 The dredge or pump discharge pipe shall be supported above the fill port in a manner which reduces stress on the PVC fill port. Excessive movement of the dredge or pump discharge pipe during filling can result in damage to the Geotextile container or to the PVC fill port. The Connection Detail supplied by the manufacturer should be followed for the best method to affix the dredge or pump discharge pipe to the fill port.

3.2 FILLING

.1 Following the tube placement, filling with materials from the source shall be accomplished in accordance with specs and drawings.

.2 The discharge line of the dredge or pump shall be fitted with a valve or manifold system to allow for control of the rate of filling or which geotextile container will be filled.

.3 The manifold system shall be fitted with an internal mechanism such as a pinch valve to allow the contractor to regulate the filling rate and pressure into the geotextile container.

.4 The manifold to be fitted with a sampling port installed close to the first point of connection to the first geotextile container to enable the contractor to sample the material being pumped to insure the proper flocculation if conditioner and or polymer are being used.

.5 Any excess discharge shall be directed away from the tubes into a designated area. Before filling, the fill ports not being used for filling shall be closed according to the manufacturer's recommendations to prevent loss of material during filling of the Geotextile containers.

.6 The geotextile containment bags are to filled to capacity.

.7 After filling, allow geotextile container to dewater. The geotextile container can be filled again to the recommended height. This process can be repeated until the geotextile dewatering process is completed and the bag is at capacity.

.8 Upon filling the tube, the Fill Port sleeves shall be closed and clamped. The geotextile containers shall be filled as evenly as possible until the design height has been achieved.

3.3 CLEANING

.1 Remove construction debris from Project site and dispose of debris in an environmentally responsible and legal manner.

3.4 PROTECTION

.1 Vehicular traffic not permitted directly on geogrid.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 35 43 - Environmental Procedures

.2 Section 01 74 21 - Construction/Demolition Waste Management And Disposal

.3 Section 31 05 17 - Aggregate Materials

.4 Section 31 32 19 - Geotextile

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM C117-04, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.

.2 ASTM C131-03, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

.3 ASTM C136-05, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.4 ASTM D422-63 (2002), Standard Test Method for Particle-Size Analysis of Soils.

.5 ASTM D698-00, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft^3) (600kN-m/m^3).

.6 ASTM D1557-02, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft^3) (2,700kN-m/m^3).

.7 ASTM D1883-99, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.1, Sieves, Testing, Woven Wire, Inch Series.

.2 CAN/CGSB-8.2, Sieves, Testing, Woven Wire, Metric.

.3 Government of Quebec: Department or Transports

.1 Cahier des charges et devis généraux (CCDG).

1.3 WASTE MANAGEMENT AND DISPOSAL

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

.2 Divert unused granular material from landfill to local quarry as approved by Departmental Representative.

Part 2 Products

2.1 MATERIALS

.1 Granular sub-base material: in accordance with Section 31 05 17 - Aggregate Materials and following requirements:

.1 Crushed, pit run or screened stone, gravel or quarry-run.

.2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.1 and CAN/CGSB-8.2.

.3 Table MG-20

Sieve Designation	% Passing
31.5 mm	100
20 mm	90-100
14 mm	68-93
5 mm	35-60
1.25 mm	19-38
0.315 mm	9-17
0.080 mm	2-7

.4 Table MG-80

Sieve Designation	% Passing
112 mm	100
80 mm	80-100
56 mm	36-60
31.5 mm	35-60
14 mm	23-45
5 mm	12-29
1.25 mm	5-17
0.315 mm	1-10
0.080 mm	0-10

.5 Other Properties as follows:

.1 Los Angeles degradation: to ASTM C131. Max% Loss by mass: 50.

.2 In accordance with “Cahier des charges et devis généraux (CCDG), Department of transports, Government of Quebec”.

2.2 QUALITY CONTROL

.1 Departmental Representative has the right to sample and proceed with tests mentioned in the present specifications on reserve aggregates. If the afore-mentioned tests show non-compliance of materials, Departmental Representative will refuse materials.

.2 If, in opinion of Departmental Representative, materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate an alternative source or demonstrate that material from source in question can be processed to meet specified requirements.

.3 Concerned reserve aggregate is accepted when all specifications requirements are met.

Part 3 Execution

3.1 PLACING

.1 Place granular sub-base after subgrade is inspected and approved by Departmental Representative.

.2 Construct granular sub-base to depth and grade in areas indicated.

.3 Ensure no frozen material is placed.

.4 Place material only on clean unfrozen surface, free from snow or ice.

.5 Place granular sub-base materials using methods which do not lead to segregation or degradation.

.6 For spreading and shaping material, use spreader boxes having adjustable templates or screeds which will place material in uniform layers of required thickness.

.7 Place material to full width in uniform layers not exceeding 150 mm compacted thickness. Departmental Representative may authorize thicker layers if specified compaction can be achieved.

.8 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

.9 Remove and replace portion of layer in which material has become segregated during spreading.

3.2 COMPACTION

.1 Compaction equipment to be capable of obtaining required material densities.

.2 Compact inferior granular sub-base material to density of not less than 90% corrected maximum dry density in accordance with ASTM D698, except last 150 mm to 95% corrected maximum dry density.

.3 Compact superior granular sub-base material to density of not less than 98% corrected maximum dry density in accordance with ASTM D698.

.4 Shape and roll alternately to obtain smooth, even and uniformly compacted sub-base.

.5 Apply water as necessary during compaction to obtain specified density.

.6 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Departmental Representative.

.7 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

.8 Get Departmental Representative’s approval before using non-standard equipment.

3.3 SITE TOLERANCES

.1 Finished sub-base surface to be within 10 mm of elevation as indicated but not uniformly high or low.

3.4 PROTECTION

.1 Maintain finished sub-base in condition conforming to this section until succeeding base is constructed, or until granular sub-base is accepted by Departmental Representative.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 01 74 11 - Cleaning

.3 Section 01 74 21 - Construction/Demolition Waste Management And Disposal

.4 Section 02 41 16 - Structure Demolition

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)

.1 ASTM D242, Standard specification for Mineral Filler for Bituminous Paving.

.2 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.5-M, Low Flash Petroleum Spirits.

.3 Ministère des Transports du Québec, Cahier des charges et devis généraux (CCDG).

.1 Norme 4101, Bitumes.

.2 Norme 4102, Enrobés à chaud selon le principe de la méthode de Marshall.

1.3 SAMPLES

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

.2 Submit to Departmental Representative, at least 3 weeks before beginning Work, samples of material for sieve analysis or certificates to confirm that materials in accordance with specifications.

1.4 WASTE MANAGEMENT AND DISPOSAL

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

.2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.3 Divert unused asphalt from landfill to facility capable of recycling materials.

Part 2 Products

2.1 MATERIALS

.1 Aggregates: to CCDG.

.2 Prime coat and tack coat: to CCDG.

.3 Asphalt concrete: to CCDG.

.1 Asphalt: PG58-28 type.

.2 Asphalt concrete: ESG-14 type.

Part 3 Execution

3.1 PAVEMENT THICKNESS

.1 Pavements:

.1 Single course: 1 layer 75 mm of ESG-14.

3.2 PAVEMENT CONSTRUCTION

.1 Application of prime coat and tack coat: CCDG.

.2 Construction of asphalt concrete: CCDG.

.1 Consider actual drainage of wharf.

.2 Afford to block partially or totally weep holes or compression grating.

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 31 23 33 - Excavating, Trenching and Backfilling

.4 Section 31 05 17 - Aggregate Materials

.5 Section 32 11 19 - Granular Sub-Base

.6 Section 32 12 17 - Asphalt Paving (short form)

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

- .1 ASTM C 109/C109M, Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 in. or 50 mm Cube Specimens)
- .2 ASTM C174 Test Method for Measuring Thickness of Concrete Elements Using Drilled Concrete Cores
- .3 ASTM C 260, Specification for Air-Entraining Admixtures for Concrete
- .4 ASTM C 309, Specification for Liquid Membrane-Forming Compounds for Curing Concrete
- .5 ASTM C 494M, Specification for Chemical Admixtures for Concrete
- .6 ASTM C 827, Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures
- .7 ASTM C1040 Test Method for Density of Unhardened and Hardened Concrete in place by Nuclear Methods
- .8 ASTM C1170 Test Methods for Determining Consistency and Density of Roller-Compacted Concrete Using a Vibrating Table
- .9 ASTM C1435 Standard Practice for Molding Roller-Compacted Concrete in Cylinder Molds Using a Vibrating Hammer
- .10 ASTM D1752, Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction

.2 Canadian Standards Association (CSA International)

- .1 CAN/CSA-A3000, Cementitious Materials Compendium.
- .2 CAN/CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete

.3 Government of Quebec, Department of Transports

- .1 Cahier des charges et devis généraux (CCDG)

.4 Bureau de normalisation du Québec (CAN/BNQ)

- .1 CAN/BNQ 2501-255 - Sols - Détermination de la relation teneur en eau-masse volumique - Essai avec énergie de compactage modifiée (2700 kN.m/m³)

.2 CAN/BNQ 2621-905 - Bétons de masse volumique normale et constituants - Protocole de certification.

1.3 SAMPLES

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

.2 Inform Departmental Representative of proposed source of aggregates and provide access for sampling at least 4 weeks prior to commencing work.

1.4 CONTROL SUBMITTALS

.1 Submit control submittals to Departmental Representative at least 15 days before start of RCC placement. Submit detailed plan for placing procedures, compacting and curing of RCC, not less than 7 days before proposed start of RCC work.

.2 Details include:

.1 Contractor's construction schedule for RCC work.

.2 RCC laydown pattern showing:

.1 Direction of paver

.2 Paving width

.3 Daily production

.4 Curing pattern

.5 Planned longitudinal and transverse cold joints.

.3 Certification that aggregates meet specified requirements.

.4 Manufacturer's data and specifications for mixing plant, placing, laydown and compaction equipment.

.5 Layout of plant showing location, aggregate storage, water supply and mixing plant.

.6 Methods of handling, storing, delivery and mixing of materials.

.7 Procedure for placing, compacting and curing RCC.

.3 Submit RCC mix design to Departmental Representative for review 4 weeks prior to commencing work. Indicate mix design, details of cementitious materials, compressive and flexural strengths for proposed mix and required density after placement, with certification by qualified professional engineer registered or licensed in Province of Quebec, Canada.

1.5 CERTIFICATIONS

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

.2 Minimum 4 weeks prior to starting concrete work submit to Departmental Representative manufacturer's test data and certification by qualified independent inspection and testing laboratory that following materials will meet specified requirements:

.1 Portland cement

.2 Blended hydraulic cement

.3 Supplementary cementing materials
.4 Grout
.5 Admixtures
.6 Aggregates
.7 Water
.8 Joint filler

.3 Provide certification that materials used in RCC comply with required quality, resistance, performance and requirements of CSA-A23.1/A23.2, and that mix design is adjusted to prevent alkali aggregate reactivity problems.

.4 Provide certification that plant, equipment, and materials to be used in concrete comply with requirements of CAN/CSA-A23.1/A23.2.

1.6 QUALITY ASSURANCE

.1 Minimum 4 weeks prior to starting concrete work, submit proposed quality control procedures in accordance with Section 01 45 00 - Quality Control for Departmental Representative's approval for following items:
.1 Granular Base preparation and control of humidity level
.2 Hot weather concrete
.3 Cold weather concrete
.4 Curing
.5 Finishes
.6 Joints

1.7 DELIVERY AND STORAGE

.1 Unload cement and fly ash and store in weathertight bins or silos that protect cement and fly ash from dampness and contamination and provide easy access for inspection and identification of each shipment.

.2 Deliver and stockpile aggregates in accordance with Section 31 05 17 - Aggregate Materials. Stockpile minimum 50 % of total required amount of each size of aggregate prior to beginning mixing operation.

.3 Store curing compounds and miscellaneous materials as recommended by manufacturer.

.4 Provide Departmental Representative with copies of freight bills as shipments are received. Departmental Representative reserves right to check weights as material is received.

1.8 WASTE MANAGEMENT AND DISPOSAL

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

.2 Designate a cleaning area for tools to limit water use and runoff.

.3 Carefully coordinate the specified concrete work with weather conditions.

.4 Ensure emptied containers are sealed and stored safely for disposal away from children.

.5 Prevent plasticizers, water-reducing agents and air-entraining agents from entering drinking water supplies or streams. Using appropriate safety precautions, collect liquid or solidify liquid with an inert, non-combustible material and remove for disposal. Dispose of all waste in accordance with applicable local, provincial and national regulations.

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

1.9 ENVIRONMENTAL REQUIREMENTS

.1 Place RCC when air temperatures are minimum 5 ^{o}C and rising, when it is not raining, when rain is not imminent and when there is no risk of RCC tracking by rollers.

.2 When combination of daily maximum temperatures and wind conditions may lead to extreme loss of moisture due to evaporation from RCC, discontinue operations and continue after Departmental Representative's approval. See CSA A23.1/A23.2 Appendix D, Guidelines for Curing and Protection.

PART 2 Products

2.1 MATERIALS

.1 Portland cement: GU (type 10) to CAN/CSA-A3000.

.2 Blended hydraulic cement: to CSA A3000.

.3 Fly ash: to CAN/CSA-A3000. Obtain approval of Departmental Representative for fly ash quantities greater than 25 % replacement of Portland cement.

.4 Water: to CSA A23.1/A23.2.

.5 Aggregates: to CAN/CSA A3000. Coarse aggregates of normal density.

.6 Curing compound:

.1 Water: to CSA A23.1/A23.2.

.2 Liquid membrane forming curing compound: to ASTM C309, type 1.

.3 Emulsified asphalt (SS-1): to CCDG.

.7 Premoulded joint fillers:

.1 Bituminous impregnated fibre board: to ASTM D1751.

2.2 MIXES

.1 RCC in accordance with CAN/CSA-A3000 and CAN/CSA-A23.1/A23.2.
Mix proportions are specified below.

.1 Concrete:

.1 Type 10E- SF Portland cement.

.2 Coarse aggregate.

.1 Diameter: 14-20 mm.

.2 Contents: 1 250 kg/m^3

.3 Minimum cement content: 250 kg/m^3.

.4 Water/Cement content: 0.35.

.5 Paste volume: 21 %

.6 Chemical admixtures: water reducing strength increasing, set retarding, accelerating, strength increasing, air entraining, super plasticizers, following admixtures in accordance with ASTM C 494.

.2 Changes to RCC mix to be approved by Departmental Representative. Should change in material source by proposed, new mix design must be approved by Departmental Representative.

2.3 ROLLER COMPACTED CONCRETE MIXES

.1 RCC to be prepared in accordance with CAN/CSA-A23.1/A23.2. Mix characteristics are specified below.

.1 Compressive strength: specified 7-28 days compressive strength to be minimum 45 MPa.

.2 Flexural strength: specified 7-28 days modulus of rupture to be minimum 5 MPa.

.3 Consistency: between 60 and 90 sec. according to ASTM C1170, Method A Vebe measured, frequency modulation 50-60 Hz, and table amplitude of approximately 0.5 mm.

.4 Compaction:

.1 100% of the Reference Density (RD) after compaction.

.2 Reference Density (RD) is the wet specific weight mass at water content determined at point 3, using compacting equipment and energy in accordance with CAN/BNQ 2501-255.

PART 3 Execution

3.1 PREPARATION

.1 Place the added thickness of 100 mm of 35 MPa concrete on periphery of wharf.

3.2 GENERAL POINTS

.1 Continuous flow fabrication

.1 If plant is transportable, locate mixing plant on a site approved by Departmental Representative. Make worksite as good as original state.

.2 Stock aggregates to sizes in different piles.

.3 Protect cement and aggregates conveyors from bad weather.

.4 Cement supply system to be equipped with synchronized metering devices and feeders to prevent caking of material or variation in feed.

.5 Aggregates discharge hopper to be equipped with synchronized metering devices to measure water content of coarse and fine aggregates during fabrication. If not, perform manual measurements at regular intervals.

.6 Cementitious material feed unit: complete with either weighing or volumetric measurements, designed to separately batch or feed required percentage of each cementitious material in mixture within tolerances specified. Equip and operate silos and feeders so that no caking of material or variation in feed will occur, including use of any necessary air pressure or vacuum vents in silo

.7 Provide watertight storage tank. Add cementitious material separately in mix unit. Cementitious material and water feeding to prevent surge draw down effect (including use of any necessary air pressure regulator).

.8 When water flow regulated with metering devices, calculate reference quantity either weighing or volumetric measurements, for check up.

.9 Adjustment of silo, feeder or tank flow to be easily provided by synchronized metering devices to readily adjustable from control panel to change components proportions or to compensate for change in moisture content of aggregates.

.10 Discharge hopper with 1 tonne discharge hopper equipped with dump gates that prevent segregation.

.11 Prior to beginning RCC production, carry out complete and comprehensive calibration of plant in accordance with manufacturer's recommended procedures. Provide results in writing. Do yield checks daily. With presence of Departmental Representative, prior to or during work, do complete recalibration of plant if required by Departmental Representative.

.2 Central concrete batch plant

.1 With weighing measurements device.

.2 Aggregates discharge hopper to be equipped with synchronized metering devices to measure water content of coarse and fine aggregates during fabrication. If not, perform manual measurements at regular intervals.

.3 Plant shall be certified in good form by Bureau de Normalisation du Québec (BNQ) in accordance with NQ-2621-905 and certification to be maintain during all work production.

.4 Maximum volume of each batch to be 50% of plant mixing capacity.

.5 Mixing time to be not less than 3 minutes.

.6 Inner mix to be cleaned at least at every 100 m^3 of production, and at each day end.

3.3 PREPARATION

.1 Contractor shall provide Departmental Representative with workplan indicating RCC placing, length and width of strips, joint spacing, mix plant location, etc.

.2 Obtain Departmental Representative’s approval prior to RCC works and inform Departmental Representative 24 hours before starting RCC placement.

.3 Prior to RCC placement, obtain Departmental Representative's approval regarding proposed method for concrete protection and curing.

.4 Maintain accurate records of poured concrete indicating precisely the date, location of pour, quality, air temperature and test samples taken.

.5 The Contractor shall coordinate his pouring schedule in such a manner that uninterrupted pours are made for better uniformity of work.

.6 Plant to be a twin shaft, continuous flow pugmill mixer or central concrete batch plant. Plant to be approved by Departmental Representative. Flow and production capacity to be higher than optimal capacity of RCC equipments. It must comprise a stationary mixer, preferably of type with twinned horizontal shaft tank mixing, similar the one used in hot mix bitumen plant.

.1 Minimum plant output capacity: 200 tonnes per hour.

3.4 PLACING

.1 Do concrete work in accordance with CAN/CSA-A23.1/A23.2.

.2 Submit list of equipment available and ready for use on contract and certify that listed equipment meets specified requirements.

.3 Do not proceed to work when shower forecast is over 50% or when air temperature is under 5^{o} C and stay under 5^{o} C for the next 24 hours.

.4 In case of shower, stop RCC placement and readily finish compaction of already placed RCC. Protect RCC surfaces from rain with plastic film.

.5 Compact Granular base to minimum 98 % Modified Proctor density.

.6 Grade and compact granular sub-base to obtain flat, smooth and uniform profile without soft or hard area as indicated on plans. Finished profile of sub-base prior to RCC placement to be within 10 mm in 3 m of indicated profile. Correct surface irregularities exceeding 10.

.7 Moisten surface of sub-base prior to RCC placement. Do not deposit RCC mix on sub-base that water content is too high or when air temperature under 5^{o} C.

.8 RCC placing

.1 Spread concrete over granular sub-base with self-powered pavers similar to those used for bituminous pavement. Pavers to be high compaction capacity. Place entire depth of pavement in one layer that will produce specified thickness when compacted (225 mm) and conform to required cross-section and grade. Operate pavers to prevent segregation and to produce smooth continuous surface without tearing, pulling or shoving. Use pavers that could compact RCC to 90% of reference density (RD).

.2 Maintain finisher extensions retracted during installation, except if otherwise mentioned by Departmental Representative.

.3 The side external of the finish table must be equipped with a guide used to square the top of the slope of the spread band, in order to obtain a fresh rectilinear joint at the time of the installation of the subsequent band.

.4 Place and spread RCC with pavers except for certain extremely small odd-shaped areas.

.5 Maintain RCC mix in paver’s hopper auger shaft during paving and between loads.

.9 Compacting equipment

.1 Use self-propelled smooth steel drum with mass over 9,500 kg, to be operated in static or vibratory mode.

.2 For surface finishing without bituminous pavement, use rubber-tired rollers of not less than 3,500 kg.

.3 Compact RCC mix to not less than 98 % of Reference Density (RD) to ASTM C1040.

.4 Use light-walk behind, or similar sized vibratory rollers and mechanical tampers in compaction areas inaccessible to large rollers.

.5 Establish rolling pattern that will achieve required density with minimum number of roller passes

.10 Delay

.1 Delay between RCC mix placement and compaction within 10 minutes of spreading. Complete compaction operation within 60 minutes of start of mixing, or as indicated by Departmental Representative.

.11 Curing

.1 Curing in accordance with CAN/CSA-A23.1/A23.2

.2 Keep RCC surface continuously moist by applying water distributed by sprinkler system or apply specified membrane-forming curing compound to ASTM C 309 or CAN/CSA-A23.1/A23.2

.3 Keep RCC surface continuously moist other means for minimum of 7 days or until RCC reaches 20 MPa, whichever occurs first.

.4 Immediately after final rolling, apply membrane-forming curing compound.

.5 At the end of RCC surface finishing work, only curing equipment can circulate on RCC surface until the end of curing period.

.12 Joints

.1 Fresh joint

.1 A fresh joint is the junction between fresh RCC and an adjacent RCC lane placed within 60 minutes of placing previous lane. If not, the joint is considered as a cold joint.

.2 Cold joint (sawcut construction joint)

.1 Cut the hardened RCC, full depth, at a 300 mm minimum distance of edge to eliminate the part in slope that is not compacted. Clean to expose an even, vertical RCC surface for full thickness by first removing any loose or foreign material and then brushing on thick layer of cement and water slurry. Beware not to saturate granular sub-base with water. Humidify RCC surface with new RCC placement.

.3 Separating joints

.1 Execute separating joint between fresh RCC and lateral containment elements, as indicated in plans.

.2 Prior to RCC placing, install filler for depth and width required structures. Apply curing compound or form release agent on filler. Keep filler on place during RCC placement.

.4 Control joints

.1 Pass rollers over end of freshly placed RCC mixture only when vertical cold joint is to be made. Stop cutting when cracks appears precociously on sawcut projection line.

.2 Clean sawcut and RCC surfaces with air or water jet to remove sawcut water slurry.

3.5 BATCHING OR FEEDING TOLERANCES

.1 Weighing measures:

.1	Cement:	± 2%
.2	Water:	± 3%
.3	Admixture:	± 3%
.4	Aggregate:	± 2%

.2 Concrete finishing tolerance in accordance with CAN/CSA-A23.1/A23.2.

.1 The surface finish, 24 hours after end of compaction, should not show bumps or hollows higher than 12 mm measured according to CAN/CSA-A23.1, and the level should not vary moreover 12 mm compared to the prescribed dimension.

.2 The RCC is considered to be in conformity with the present specifications if it meets the following requirements:

.1 No more than 5% of compaction measures indicate a value lower than 98%, and no measure of compaction indicates a value lower than 97%;

.2 After compaction and curing, the surface will be free of irregularities such as checking or rippling, segregation, and the areas that have been damaged during works will be repaired;

.3 An average of three consecutive results at 7-day modulus of rupture is equal or superior to 5.0 MPa, and no individual result is below 4.5 MPa. If the quantity of samples is 2 or 1, the average of both results, or unique result, has to be equal or superior to 5.0MPa at 7 days;

.4 At least 80% of the finished surface indicate a variation inferior to the tolerance of the finished surface specified in the specifications;

.5 The average thickness of a group of 5 cores from 110 to 125 mm of diameter, removed from a lot of RCC on all the surface of the RCC, is equal or superior to the required thickness calculated as follows. The surface of a lot of RCC is 4,000 m². Individual core thicknesses are measured according to ASTM C174.

.6 Required thickness = 0.36 F + specified thickness -15 mm, where F= difference between the largest and the smallest individual thickness of 5 cores from the same lot.

.7 In case of nonconformity, the Departmental Representative can refuse the work in whole or in part, prescribe additional tests and/or require appropriate corrections at Contractor expense.

3.6 FIELD QUALITY CONTROL

.1 Inspection and testing of concrete and concrete materials will be carried out by a Testing Agencies designated by Departmental Representative in accordance with CAN/CSA-A23.1/A23.2 and Section 01 45 00 - Quality Control.

.2 Departmental Representative will pay for costs of tests as specified in Section 01 29 83 - Payment Procedures: Testing Laboratory Services.

.3 Non-destructive Methods for Testing Concrete shall be in accordance with CAN/CSA-A23.1/A23.2.

.4 Inspection or testing by Departmental Representative will not augment or replace Contractor quality control nor relieve him of his contractual responsibility.

.5 Ensure test results are distributed for discussion at pre-pouring concrete meeting between testing agency and Departmental Representative.

3.7 TESTING

.1 Prior to implementation of the concrete in the work, the Departmental Representative require the realization of a test to verify if the equipment is in good working order and check the suitability of materials.

.2 With such a test, the Contractor will demonstrate the operation of the plant and the paving and compacting material to be used, and also the fabrication, transport, paving, compaction, finishing and joint execution methods. He will also have to demonstrate the operation of the equipment and materials he intends to use for protection and the curing.

.3 The test will be done on a compacted and accepted base, in or out the worksite limits (at Contractor’s choice), in the same conditions as those for the works (mixture, material, transport, placing and compaction works, labour and supervision). The test will contain at least a fresh joint, transverse and longitudinal construction joints and, if possible, one or several sawed control joints. It will be necessary to build two adjacent strips 3.7 m - 4.3 m wide and 50 m long. The first strip and half of the second one will be built on the first day, and the rest the next day.

.4 The placement of the concrete in the work will begin only if the Departmental Representative considers the test in conformity with the specifications. In the event of nonconformity, the Contractor will have to carry out a new test.

.5 If the test is carried out on the site and is considered to be in conformity with the specifications, the strips may remain in place and be part of the work; otherwise, the Contractor will have to scrap them and evacuate the material. The details and methods for the realization of the test will be indicated by the Departmental Representative.

3.8 REPAIR OF RCC

.1 Repair of deficiencies:

.1 Repair defective areas while RCC is still plastic; otherwise do repairs after 7 days curing. Repairs are subject to Departmental Representative's approval.

.2 Grind off high surface variations to finish acceptable to Departmental Representative's.

.3 Filling low areas of hardened RCC with fresh RCC is not permitted.

3.9 PROTECTION

.1 Only pneumatic-tired water spray trucks or other curing equipment are permitted on RCC pavement, after final rolling of pavement until end of curing period.

.2 Provide plastic sheeting to ASTM C171 and kept readily available to protect pavement less than 12 hours from rain.

.3 Place and maintain suitable barriers to protect finished RCC from equipment, vehicles or pedestrian traffic.

.4 Do not open finished pavement to traffic until directed by Departmental Representative.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 11 00 – Summary of Work

.2 Section 01 74 21 – Construction/Demolition Waste Management

.3 Section 02 41 16 – Structure Demolition

1.2 DEFINITIONS

.1 Dredging: excavating, transporting and disposing of underwater materials.

.2 Class A material: solid rock requiring drilling and blasting or using hydraulic hammer (tramac), and boulders or rock fragments of individual volumes 1.5 m3 or more.

.3 Class B material: loose or shale rock, silt, sand, quick sand, mud, shingle, gravel, clay, sand, gumbo, boulders, hardpan and debris of individual volumes less than 1.5 m^3;.

.4 Obstructions: material other than class A, having individual volumes of 1.5 m^3 or more.

.5 Debris: pieces of wood, wire rope, scrap steel, pieces of concrete and other waste materials.

.6 Grade: plane above which material is to be dredged.

.7 m^3mp: volume of material in place in m^3.

.8 Side slope: inclined surface or plane from subgrade at side limit of dredging area to intersect original ground line outside of side limit and to be expressed as ratio of horizontal to vertical.

.9 Chart Datum: permanently established plane from which soundings or tide heights are referenced, usually Lowest Normal Tide (LNT).

.10 Co-ordinates systems:

- .1 Universal Transverse Mercator Projection (UTM)
- .2 Modified Transverse Mercator Projection (MTM) Co-ordinates: plane rectangular coordinates used in grid system in which grid network is applied to MTM. Co-ordinates are the horizontal control information.

.11 Matrix Block: each dredge area is presented as number of 2 x 2 m long blocks. Dependent on position of sounding, block may have soundings contained within it.

.12 Least of Minimum Plan: hydrographic survey plan in which least sounding in grouping of matrix blocks is plotted.

.13 Cleared Area: area of dredging accepted by Departmental Representative and complying with plans and specifications.

1.3 REFERENCES

.1 Laws and regulations of the federal government of Canada.

- .1 Canadian Environmental Protection Act (CEPA).
- .2 Canadian Environmental Assessment Act (CEAA).
- .3 Transportation of Dangerous Goods Act (TDGA).

1.4 ENVIRONMENTAL PROTECTION

.1 Ensure Work is done in accordance with Section 01 35 43 - Environmental Procedures.

1.5 REGULATORY REQUIREMENTS

.1 Works shall comply with all federal, provincial and municipal laws. The strictest regulations shall apply in the event of any conflict or contradiction.

1.6 ELEVATION

.1 All elevation indicated in specifications or on plans refers to chart datum.

1.7 SITE CONDITIONS

.1 Contractor to visit and inspect work site and become thoroughly familiar with extent and nature of Work and conditions affecting Work before tendering.

.2 Results of prior soundings and geotechnical investigations are on drawings. Drawings of existing wharves are also included. It should be noted that this information may differ from site condition. Take this into consideration when submitting tender.

.3 Take necessary steps to become fully familiar with potential inclement weather and sea conditions in this area. There will be no additional payment for time lost due to weather conditions.

1.8 MATERIAL TO BE DREDGED

.1 The material to be dredged is composed of Class B (superficial deposits and sediments) and Class A (rock) materials. The quantities shown on the slip are approximate.

.2 For information, the top of superficial deposit is composed of silty sand with high organic matter and marine organism (seaweed, shellfish, molluscs, etc.). The core of superficial deposit is a glacial till composed of silty sand and gravel.

.3 For information, the humidity content of sediments is generally in the range of 50% to 70%.

1.9 QUANTITY OF MATERIAL TO BE DREDGED

.1 To determine the amount of Class A material to be excavated, a survey will be conducted on-site by the Contractor jointly with the Departmental Representative to determine the elevation of the rock prior to its excavation. The quantity of Class A material actually excavated will be established from the final survey and rock elevation survey prior to excavation.

.2 The volume of Class A material (rock) to be excavated is considered a theoretical volume.

.3 In order to guide the Contractor in the quantities preparation of his tender, the Department Representative estimates the quantities of contaminated sediments to be dredged from exclusion zones is approximately 4 500 cubic metres in place measurement and volume of sediments to excavate (under existing structures and outside harbour) to build new basin is approximately 20 000 cubic metres in place measurement.

1.10 FLOATING EQUIPMENT

.1 The Contractor shall supply and maintain all dredging equipment with sufficient capacity to excavate, load, transport and dispose of all materials mentioned in the specification, taking into account settling of materials and excess dredged materials as applicable. All

equipment used to execute the dredging contract shall be at all times satisfactory to the Departmental Representative.

.2 If while the work is being carried out, the equipment provided is not, in the opinion of the Departmental Representative, suitable and sufficient for performing the work properly, the Contractor shall, within 15 days following receipt of written notice from the Departmental Representative, provide other equipment subject to prior approval by the Departmental Representative.

.3 Regulatory agency sustainability approvals:

.1 Comply with municipal, provincial and national codes and regulations relating to project.

.2 Mark floating equipment with lights in accordance with Regulations for the Prevention of Collisions.

.4 Floating plant:

.1 Dredges or other floating plants to be employed on this Work, to be of Canadian registry, make or manufacture, or, must receive certificate of qualification from Industry Canada, Marine Directorate.

.2 Requests for certification to be directed to Director, Defense and Marine, Directorate, Industry Canada, 235 Queen Street, 7th Floor, East Tower, Ottawa, Ontario, K1A 0H5.

1.11 WORK SURVEYS

.1 The Contractor shall provide, at its own expense, the team and equipment necessary to identify and monitor the dredging area boundaries and the various surveys to be conducted immediately after each excavation phase in order to verify the depth reached as a result of the work and to determine the volumes actually excavated.

Part 2 Products

2.1 MATERIAL AND DREDGING EQUIPMENT

.1 The equipment and heavy machinery must be operated in a manner that meets or exceeds the requirements of all applicable fume standards.

.2 Stop the machines immediately after use, unless extreme temperatures require uninterrupted operation.

.3 The rock shall be excavated using a hydraulic jackhammer. Blasting is prohibited.

2.2 BEDROCK DESCRIPTION

.1 The rock in the work area is composed of red conglomerate and mudstone, also a grey sandstone.

Part 3 Execution

3.1 GENERAL

.1 During dredging Work, Contractor shall consider removing and replacing anchor blocks and chains of floating docks from upstream basin.

.2 The Contractor shall provide, to Departmental Representative, a location plan of anchor blocks of both floating docks lines.

.3 The use of geotextile containers system for decontamination of sediments from exclusion zones requires the use of a pumping dredging device.

.4 When dredging in the exclusion zones, a sediment control curtain shall be installed in the work area to confine contaminated sediments. The curtain must always allow the passage of anadromous species between the Petite Rivière and the Gulf of St. Lawrence.

.5 Place and maintain buoys, ranges, markers and lights required to define work and disposal areas.

.6 Stake and maintain the work based on proper reference and control points provided by the Departmental Representative. The Contractor shall be responsible for the accuracy of the work in relation to proper reference points, control points and baselines. Obtain written permission from the Departmental Representative before establishing reference points or placing markers on private property and pay all rental fees arising from this practice. If necessary, repair any damage to private property to the satisfaction of the Departmental Representative and pay all costs arising from this work. Provide all additional control points (over and above those indicated) necessary for the proper execution of dredging operations. Throughout the project, ensure that all control points remain in good condition.

.7 If necessary, install and maintain in good condition the landmarks used to locate and define the boundaries of areas designated for dredging. The benchmarks used must be appropriate to control dredging and bathymetric survey operations. Provide the labour and equipment needed for the construction of these benchmarks. Remove the benchmarks once the work is completed.

.8 Establish and maintain water level gauges or tide boards in order that proper depth of dredging can be determined. Locate gauges or tide boards so as to be clearly visible.

.9 Dredge side slopes as shown on drawings.

.10 Unless otherwise indicated on the plans and specifications, dredge the side slopes at a ratio of one vertical to one horizontal.

.11 Only material excavated above grade plane and within side slopes indicated to be measured

3.2 DREDGING IN VICINITY OF STRUCTURES

.1 Take all necessary precautions to protect existing structures located in the vicinity of the work. Any damage to such structures shall be repaired at the Contractor’s expense.

.2 Since dredging and rock excavation are near the existing wharf that is to be maintained, the Contractor shall take the necessary precautions to avoid any accidents and any damage to property. The Contractor shall obtain and provide all necessary insurance policies to this effect.

3.3 SWEEPING AND RELOADING

.1 The Contractor shall pay particular attention to the existing structures and the two (2) exclusion area during the post-dredging and 300 mm thick reloading levelling operations.

3.4 DISPOSAL OF DREDGED MATERIAL

.1 The dredged material shall be used for reloading after post dredging operations in exclusion area of the two (2) existing basins.

.2 The dredged material shall be used as quarry-run for the breakwater core.

.3 Dredged Class B materials (sediments and superficial deposits) shall be placed in priority for post dredging reloading and breakwater core.

3.5 CO-OPERATION AND ASSISTANCE TO DEPARTMENTAL REPRESENTATIVE

.1 Co-operate with Departmental Representative on inspection of Work and provide assistance requested.

3.6 SURVEYS

.1 After demolishing the existing structures and excavating sediments, the Contractor shall conduct a survey of the seabed. This survey will be used to confirm that the depth indicated on drawing has been reached or to help determine, jointly with the Departmental Representative, the amount of rock to be excavated using a hydraulic hammer.

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.

1.2 MEASUREMENT AND PAYMENT

.1 Mobilization/demobilization of equipment will not be measured for payment.

.2 Construction and maintenance of haul roads will not be measured for payment.

1.3 REFERENCES

.1 American Society for Testing and Materials (ASTM)

- .1 ASTM C88, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
- .2 ASTM C117, Standard Test Method for Material Finer than 0.075 mm Sieve in Mineral Aggregates by Washing.
- .3 ASTM C127, Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate
- .4 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- .5 ASTM C535-e1 Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

.2 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-8.1, Sieves, Testing, Woven Wire.
- .2 CAN/CGSB-8.2, Sieves, Testing, Woven Wire, Metric.

1.4 SUBMITTALS

.1 Samples

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Inform Departmental Representative of proposed source of materials and provide access for sampling at least 3 weeks prior to commencing Work.
- .3 Submit to Departmental Representative stone's test data for approval.

.2 Submit for review by Departmental Representative proposed method of handling existing stone. Submission to cover phases of handling until final positioning at breakwater.

.3 At least 4 weeks prior to commencing work, Submit work schedule for approval by Departmental Representative.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Replace defective or damaged materials with new.

1.6 WASTE MANAGEMENT AND DISPOSAL

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

Part 2 Products

2.1 GENERAL

.1 All the stones shall comply with the entire range of requirements herein set forth. The Departmental Representative may, at any time during construction and throughout the project, refuse materials at the source or the worksite if they do not meet requirements. Materials delivered to the worksite and rejected either in a stockpile or after placement in the work, shall be removed at Contractor's expense.

.2 In this project, the control plan and QC & QA activities shall systematically apply throughout both the quarrying and construction phases.

2.2 STONE SOURCES

.1 The Contractor is solely responsible for ensuring that the selected supply sources will be able to meet the delivery schedule and produce stones of the required quality in sufficient quantities for the project.

.2 If, as construction activities unfold, the Contractor is unable to provide acceptable stones in sufficient quantities from the original supply source, he may request an authorisation to use another source. All the expenses resulting from a change in the supply sources, including the required sampling and testing, shall be at Contractor's expense. In addition, no extension of the execution date set for this contract will be allowed.

2.3 MATERIALS

.1 Rock materials:

.1 Stone shall be a rough broken stone from a quarry.

.2 The use of conglomerate, sandstone, shale or slate and round stone is not accepted in any part of the work.

.3 All stone shall be highly resistant to weathering, deterioration and disintegration under freeze-thaw cycles and exposure to water, and or a suitable quality to ensure permanence in the structure and in the climate in which it is to be used.

.4 Stone shall be a rough broken stone from a quarry. Stone shall be durable, sound and free of cracks, seams and other defects that would tend to increase deterioration from natural causes or result in breakage during handling and/or placement.

.5 Inclusions of dirt, sand, clay, shale, of quartz or mica, pegmatite, oil or oil-stained stones, rock fines or any organic or other delirious material will not be permitted,

.6 Maximum petrographic Number: 130.

.7 All stones of each category to be used shall be evenly distributed into each stone class indicated in specifications.

.8 Categories of stone to supply

.1 Armour stone

.1 9 @ 15 m.t.

.2 6 @ 10 m.t.

.3 1 @ 2 m.t.

.2 Filter stone :

.1 0.5 @ 1 m.t.

.2 300 @ 500 kg

.3 0-600 mm sieved Quarry-run (max 10% -50 mm sieve)

.2 Stone sampling and testing method

.1 References concerning testing methods are listed above in Section 1.3 - References

.2 Stone samples used in laboratory tests shall be typical of the lithologic unit of each category of stone proposed for use in the work of this project.

2.4 TRIALS

.1 At least three (3) weeks prior to stone production start-up, Contractor shall notify Departmental Representative of proposed source of materials.

.2 A minimum of two (2) weeks is included in this three (3) weeks period for laboratory tests.

.3 The Departmental Representative may require other tests during the execution of the work.

.4 The Department Representative will be responsible for the cost of laboratory trials, otherwise trial show non-conformance.

.5 Stone samples to be submitted at any time for laboratory testing shall be taken in the presence of the Departmental Representative or of a representative of the designated laboratory.

.6 Contractor shall submit report of stone delivered on worksite.

Tableau 1 – Required stone quality testing – Methods and acceptance criteria

Test name	Test method	Acceptance criteria Imported Stone
Field observations / Visual Inspection / Assessment		
Field examination[1]	ASTM D4992-07	No conglomerates No delirious materials; good to excellent quality for intended use
Petrographic examination[2]	ASTM C295-03	No delirious materials; good to excellent quality for intended use
Watering grade	Visual	1A – fresh, unweathered rock 1B – faintly weathered rock (staining on major discontinuity surfaces)
Laboratory testing		
Bulk specific gravity, SSD	ASTM C127-07	≥2.65
Water absorption[3]	ASTM C127-07	≤0.5%
Water resistance micro-Deval[4]	ASTM D6928-06	≤15%
MgSO4 Soundness	ASTM C88-05	≤1.5% loss after 5 cycles

Notes:

1 The field examination shall include the preparation of a written report that includes a summary of the quarry and proposed quarry development plan as per ASTM D4992-07, including : general lithology, geologic unit and age, source homogeneity, stratigraphic faces; metamorphic and weathering phases; dip, strike and thickness of the bedding; proposed blasting procedure and expected curing time.

2 Petrographic examinations shall be repeated before AND after the MgSO4 soundness testing. Petrographic examination shall be summarized in a written report that includes the presence of micro-fractures and/or signs of induced stress (and therefore possible stress release – ref. paragraph 3.2) that may be of concern for the proposed use.

3 Water absorption test shall be repeated on five (5) different pieces of rock.

4 Wear resistance test shall be repeated on two (2) different pieces of rock

2.5 STONE SORTING

.1 Pilot stones indicating the limits of stone size will be weighed and placed near worksite to ease the selection of stone.

2.6 TOLERANCE ON WEIGHT AND SHAPE OF STONES

.1 At least 90% in weight of stones of a category placed in structure shall be comprises between weight limits of the category.

.2 No more than 5% in weight of stones of a category, shall weight between 0.75 to 1 time the minimal weight required for that category.

.3 All stone weighting less than 0.75 time the minimal weight or more than 1.25 the maximum weight of the category will be refused, deduced from quantity and transported out of worksite. Fees for transport of refused stone will be to Contractor responsibility.

.4 Stones of a category have to be uniformly divided into size in all breakwater, in order to avoid creating sections of breakwater with concentration of the same size of stone inside a given category.

2.7 STONE GRADATION AND SHAPE

.1 The methods used for production, transportation and placement must be adjusted to the needs in order to ensure that the materials placed in the final stage are within the prescribe range for weight. Stones must therefore undergo gradation testing and shall not display discontinuities or defects in their individual size ranges.

.1 For gradation testing, a random sample of stones must be collected weighing at least 25 times the average weight of stones in the category. Each individual stone in the sample shall be measured over three (3) mutually perpendicular axes. The dimensional ratio and the weight of each stone shall be estimated using the unit weight of the type of rock at hand per unit of volume measured and shall be recorded in a table.

.2 In addition, the weight of the whole sample shall be measured. This information is used to produce a “correction factor” to adjust the estimated weight of stones with regard to their actual weight. Each stone in the sample may also be weighed individually. With this data, a gradation chart can be established for the sample.

.3 Although it is required that an adequate spreading over the entire range of sizes be obtained each category, at least 50% of the stones – in numbers, shall be heavier than the average weight of the stones.

.4 Stones shall display an angular or blocky shape with a maximum 3/1 dimensional ratio (1/d).

.5 In each category, only ten percent (10%) of the stones – in numbers, may display a dimensional ratio in excess of 2,5/1.

.6 Stones with a dimension ratio comprised between 2.5 and 3.0 shall never be placed flat or under water level.

.7 Stones with a dimension ratio over 3 will be refused.

2.8 THEORICAL QUANTITIES

.1 In order to guide the Contractor in the quantities preparation of his tender, the Department Representative estimates the quantities of each stone category.

Part 3 Execution

3.1 PREPARATION

.1 Haul roads: construct and maintain haul roads.

.2 If required, install traffic lights on floating equipment in accordance with international regulations, and maintain on board a radio operator system.

.3 Install and keep in good state buoys, direction signs, bench marks and traffic lights used to delimit work site.

.4 Stake and maintain the work based on the proper reference and control points provided by the Departmental Representative. The Contractor shall be responsible for the accuracy of the work in relation to proper reference points, control points and baselines. Obtain written permission from the Departmental Representative before establishing reference points or placing markers on private property and pay all rental fees arising from this practice. If necessary, repair any damage to private property to the satisfaction of the Departmental

Representative and pay all costs arising from this work. Provide all additional control points (over and above those indicated) necessary for the proper execution of operations. Throughout the project, ensure that all control points remain in good condition.

.5 If necessary, install and maintain in good condition the landmarks used to locate and define the boundaries of designated work areas. The benchmarks used must be appropriate to control work and bathymetric survey operations. Provide the labour and equipment needed for the construction of these benchmarks. Remove the benchmarks once the work is completed.

3.2 QUALITY CONTROL DURING PRODUCTION

.1 The Contractor shall carry out Quality Control activities throughout the stone production and placement period as required in this section and in section 01 45 00 – Quality control.

.2 The weighing of stones, or their re-measurement, shall be carried out to ascertain the calculated weight either when the Departmental Representative questions the size of stones or when the inspector deems it appropriate.

.3 Drop tests shall be carried out when the Departmental Representative questions the quality or integrity of stones or when the inspector deems it appropriate. Drop tests shall be carried out as follows:

- .1 Visual inspection of the stone on all sides; marking/recording of all existing cracks;
- .2 Lift the stone to 3 m and drop it onto a rigid surface (bedrock or stone of similar size);
- .3 Visual inspection of the stone on all sides to identify existing and/or developing cracks;
- .4 Repeat at least three times as directed by the Departmental Representative;
- .5 The stone is acceptable for the intended purpose if existing cracks have not open and no new cracks have developed.

.4 The Contractor is notified that adverse weather conditions (rain, snow, ice, frost and mud) may hide or conceal defects that would otherwise have been identified. Winter conditions may postpone the required inspection of stones until the next Spring. Stones shall not be shipped to the worksite before their inspection.

.5 Except where gradation tolerances allow it, any broken or cracked stone, stones that do not meet gradation standards and stones that are not correctly placed in the structure shall be removed and replaced with satisfactory stones. This corrective measure is at Contractor’s expense. Rejected materials shall be removed from the worksite without delay. Such materials are excluded from measurement and payment.

3.3 TRANSPORT AND TEMPORARY STORAGE

.1 The Contractor shall take charge of the transportation and storage of the stones and ensure that stockpiles are not contaminated with dirt or other substances; he shall also inhibit size segregation of stockpiled material.

.2 The Contractor shall implement measures to prevent introduction of invasive alien species in accordance with Section 01 35 43 – Environmental Procedures

.3 The storage of stones after shipment from the quarry and before permanent placement into the structure shall be submitted to the Departmental Representative for approval.

.4 Underwater storage of stones is not authorized.

3.4 MEASUREMENT OF STONE

.1 All stone materials shall be measured for payment by metric ton unit (1000 kilograms), for material acceptably placed in the work according to certified scale tickets as follows and Section 01 11 11 – Summary of Works:

.1 The Contractor shall proceed to the installation and the certification of an electronic weigh scale at the barge leading site(s) before shipping the stones. Weigh scale shall be of register type and have a sufficient size and capacity to weigh the stone and their means of transportation. The size of weight scale shall allow the receiving of all the wheels of the means of transportation used by the Contractor or the subcontractor.

.2 The Contractor shall supply each day to the Departmental Representative scale ticket copies for all stones delivered on site, separated by category.

3.5 TERMINOLOGY

.1 In the description of the stone construction, one must refer to the survey control line (CL) and the neat lines. The following definitions shall apply to those items:

.1 Survey control line (CL) – Line shown on the contract drawings to which all breakwater surveys shall be referenced;

.2 Neat lines – Solid lines shown on the contact drawings which depict the limits of the various types of stone materials. Tolerances for the placement of the stones described in this section are perpendicular to these neat lines.

.3 The word “ton” (t) refers to the metric ton (1 m.t. = 1000 kg).

3.6 RUBBLE MOUND

.1 The Contractor is free to choose the construction process. However, he shall be held responsible for any damage caused during construction and shall make good the work at his own expense and to the Departmental Representative’s satisfaction. It would be preferable for the Contractor to place armour stone as work progresses.

.2 The Contractor shall use suitable equipment to place the stones in the correct location and on the grades and slopes shown on drawings. He shall replace any badly placed stones at his own expense.

.3 Before placing the stone, ask Departmental Representative to check alignments.

.4 Discharge of armour stone will not be allowed. Place each armour material, stone by stone, starting from the bottom of slope and so that stone is stable and in contact with all adjacent stones.

3.7 CORE STONE

.1 Place core material to lines, grades and dimensions as indicated. Use dredged material, crushed concrete or quarry-run as indicated on drawings.

3.8 ARMOUR AND FILTER STONE

.1 Place armour stones and filter stones to lines, grades and dimensions as indicated.

.2 Place armour stone in courses to total layer thickness as indicated on drawings.

.3 Place each stone or dolosse in stable position.

.4 Place stone to obtain an optimal stability and criss-cross action.

3.9 DEFORMATION

.1 In case of deformation of any part of the work during construction or after construction but before acceptance, the Contractor shall remove the displaced materials and rebuild this portion of the structure using either new materials or the displaced materials if deemed appropriate.

.2 Stone placement prior to the installation of the outer protection shall be at Contractor's own risk.

3.10 TOLERANCES

.1 Surfaces obtained shall not deviate from the lines and grades indicated on the contract drawings in a range of plus or minus the tolerances indicated below. Tolerances are measured perpendicularly to the indicated neat lines.

.2 Extreme limits of the tolerances given below shall not be continuous in any given direction over five (5) times the average dimension of a stone and/or over more than ten square metres of structure surface area.

.3 Any section of a stone course built to the upper tolerance limit shall not be in the immediate vicinity of a section built to the lower limit and vice-versa. In other words, transitions between tolerance limits shall be smooth.

MATERIAL	ABOVE CHART DATUM	BELOW CHART DATUM
Armour stone	40 cm	50 cm
Filter stone	25 cm	30 cm
Quarry-run	20 cm	20 cm

.4 In addition to the above-indicated perpendicular tolerances with reference to the slope, the horizontal position of every break in grade of finished stone courses shall be less than 60 cm to the indications on drawings. The variation shall not be systematic in one way or the other. Lines, arcs and curves lines shall be continuous and smooth, without visible deflection, bends or kinks.

.5 The above tolerances aim at ensuring that the work is constructed to the required heights, slopes and levels. Placed material that would not meet these requirements shall be removed or reworked as directed by the Departmental Representative.

3.11 CIRCULATION ON THE BREAKWATER

.1 Circulation on the breakwater is restricted by the width and the design of the structure. Construction of a temporary access road can be considered, but only if done using mats, geotextiles or other temporary working surfaces in order to make sure that there will be no remaining contamination of the breakwater with unacceptable materials. In all cases, the construction method of such temporary access road will have to be approved by the Departmental Representative.

3.12 DEBRIS

.1 Unless otherwise indicated by the Departmental Representative, all the timbers, the unsatisfactory materials and the debris within the construction zone shall be removed and become the Contractor's property. All the materials shall be disposed of as required in sections 01 35 43 – Environmental Protection and 01 14 00 – Work restrictions.

3.13 TURBIDITY CONTROL

.1 The Contractor shall control stone placement in such way to minimize water turbidity. Contractor operations shall comply with the requirements of Sections 01 35 43 Environmental Protection and 01 14 00 – Work restrictions.

3.14 ARTIFICIAL REEF

.1 Work involves construction of six (6) artificial reefs offshore fishing harbour of Sainte-Thérèse-de-Gaspé.

.2 Each artificial reef measuring 20 m long by 10 m wide and is divided into 5 rectangular sections with stones of different sizes. Each reef comprises:

- .1 A central section of 5 x 10 m, consisting of 23 m.t. of 100 to 200 mm stones.
- .2 Two transition sections of 4 x 10 m, each consisting of 26 m.t. of 200 to 400 mm stones, for a total of 52 tons of stone. They are located on either side of the central section.
- .3 Two end sections of 3.5 x 10 m, each consisting of 36 m.t. of 400 to 750 mm stone, for a total of 72 tons of stone. They are located at the ends of the reef.

.3 The reefs shall be built no later than November 15th, 2015.

.4 A complete bathymetric survey will be made by Departmental Representative, after work, to ensure that the height of the reefs do not exceed lower limit below chart datum required by the Navigation Protection Act. In the presence of improper height, Contractor shall return to site at its own expense and before December 31st, 2015 to make the necessary adjustments to avoid exceeding the required minimum depth.

.5 The contractor shall hire a professional diving company to verify the physical compliance of reefs and their general condition. A written report with video and pictures must be provided to the Departmental Representative no later than December 15th, 2015.

3.15 VERIFICATION OF REEF COMPLIANCE

.1 Soon after reefs construction, in the fall, the Contractor shall conduct a verification of the general condition and compliance of work by an underwater video description.

.2 The Contractor shall hire a professional diving company to verify the compliance of reefs and their condition. A written report with video and pictures must be provided to Departmental Representative no later than December 15th 2015.

.3 Visual check in Diving

.1 Visual check by underwater video will be made for each reefs

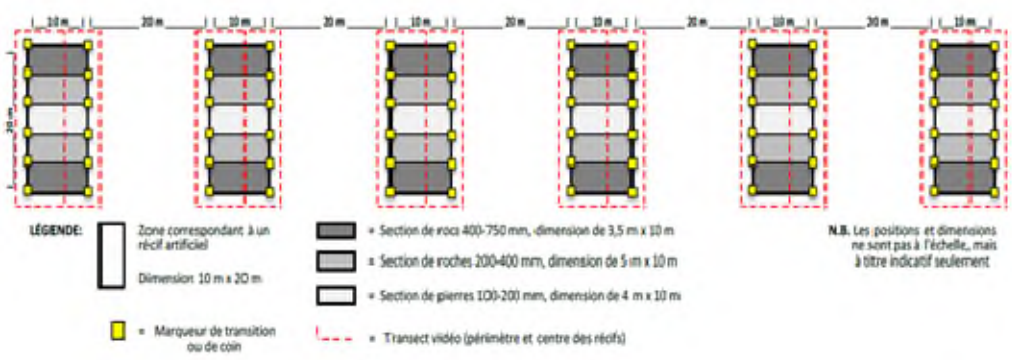
.2 Video footage will be taken along the perimeter of the reef and along a band across the reef in the center line.

.3 The starting point of the video sequence of the perimeter of a reef will always be the same corner of the reef; this corner is permanently clearly marked.

.4 Going through the perimeter of the reef, the diver will identify his position by indicating each substrate transition (large, medium and small stones) and each corner. The camera will be oriented so as to get a view of the edge of the reef and the natural substrate.

.5 Divers shall clearly identify the transition between large, medium and small stones, as well as every corner of the reef. This will help detect physical changes of reef in subsequent evaluations of its integrity. The marking will be determined later, after a discussion with the divers.

.6 This is the experimental draft of visual underwater verification of artificial reefs to be made after construction.



3.16

.1 Deliverables – Verification of reefs compliance

.2 A draft report should be submitted to Departmental Representative

.3 The final report must be provided to Departmental Representative 10 days after the receipt of comments on the draft. The final report in PDF format (including appendices) and all files in original format (Word, Excel for tables, jpeg for all photographs and Autocad for drawings) should be on the electronic medium.

.4 The report shall contain the following (without limitation):

.1 A brief background and objectives;

.2 Description of work and methodology used.

.3 .A compact disc of the video of the compliance verification of reefs

.1 The video must be of DVD quality in high definition, be carried out under good visibility conditions. The diver must carry video as still as possible and ensuring that focus is adequate throughout the video. The video will be analysed by an independent consultant so it is essential that it be of high quality.

.2 Photographs could also be taken along transects.

.4 Mapping and location of each reef

.1 For each reef, submit the following information:

.1 Position corners

.2 Dimensions of stone size sections

.3 Reef Height

.4 Reef Depth

.5 Weather conditions, speed and wind direction, sea conditions, waves, underwater visibility

.6 Visual description by underwater video

.7 Qualitative description of the integrity and stability of the different sections of stones of reefs

.8 Brief description of the fauna and flora established on the reefs, seen in the video overview (locate observations on a general layout, identified to the species)

.5 Materials and equipment

.1 Contractor shall provide all materials and equipment for the implementation of audit work, and ensure the proper use of equipment.

.6 Sitemap

.1 Sitemap in electronic format (AutoCAD) and the final position of the reefs will be provided to the Contractor after the notice of acceptance of offer.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittals procedures

.2 Section 01 61 00 – Common Product Requirements

.3 Section 05 50 00 – Metal fabrications

.4 Section 06 05 73 – Wood treatment

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

- .1 CAN/CSA G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .2 CAN/CSA O80, Wood preservation.
- .3 CSA W47.1, Certification of Companies for Fusion Welding of Steel Structures.
- .4 CSA W48, Filler Metals and Allied Materials for Metal Arc Welding.
- .5 CSA W59, Welded Steel Construction (Metal Arc Welding) [Metric].

1.3 SUBMITTALS

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

.2 Provide shop drawings or data sheets of floating dock components:

- .1 Bolt products
- .2 Steel components
- .3 CCA Treated timber
- .4 High density expanded polystyrene buoyancy billets (20 psi min)
- .5 Aluminum Gangway (specs and engineering drawings)

.3 Sustainable Design Submittals:

- .1 Wood Certification: submit supplier's Chain-of-Custody Certificate number for FSC certified wood.

1.4 SHOP DRAWINGS

.1 Submit shop drawings including fabrication and erection documents and materials list in accordance with Section 01 33 00 - Submittal Procedures.

.2 Erection drawings: indicate details and information necessary for assembly and erection purposes including:

- .1 Methods description.
- .2 Sequence of erection.
- .3 Type of equipment used in erection.

1.5 QUALITY CONTROL

.1 Remove defective or deemed non-compliant with the contract documents and rejected by the Departmental Representative, either because they were not conducted according to the rules of the art, either because they were made of materials or defective products, even if they have already been included in structure. Replace or repair components as required by the contract documents.

1.6 TRANSPORTING, STORING AND HANDLING

.1 Packing, Shipping, Handling and Unloading:

.1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 – Basic Product Requirements.

.2 Handle steel pieces so as to avoid permanent deformations.

.3 Handle with care steel pieces that have received a special coating.

.2 Storage and Protection:

.1 Leave protective covering in place until final cleaning of building. Provide instructions for removal of protective covering.

Part 2 Products

2.1 MATERIALS

.1 Steel:

.1 All steel parts must be galvanized in compliance with standards ASTM A123/123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Production.

.1 Galvanize the various parts in accordance with the following rates:

.1 Bolts and nuts: 460 g/m2;

.2 Section, plates and rods: 705 g/m2

.2 All mechanical bolts, lag screw, nails shall be galvanized, medium grade steel in accordance with ASTM A-307, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.

.3 Machine bolts, lag screw and drift bolt will have forged heads.

.4 Lag-screw to be threaded

.5 The lag bolt holes must conform to the following:

.1 The pilot hole for the bolt shank must be the same diameter as the bolt shank and the same height as the bolt shank length without the thread.

.2 The diameter of the pilot hole for the threaded portion must be 60 to 75 percent of the diameter of the bolt shank for the length equal to the threaded portion of the bolt.

.3 The threaded portion of the screw must be inserted into the pilot hole by turning the screw with a wrench and not by using a hammer.

.4 Soap or any other lubricant that is not petroleum based may be used on the screw or in the pilot hole in order to facilitate insertion and prevent damage to the screw.

.2 Wood:

.1 FSC certified.

.2 The spruce, jack pine and eastern hemlock will meet the requirements of the latest standard grading rules of the ¨Eastern Spruce Grading Committee¨ approved and published by the Canadian Lumbermen's Association, the Quebec Lumber Manufacturers Association and the ¨Maritime Lumber Bureau,¨ with the exception of the balsam fir which will not be accepted although it is mentioned in rule No. 1.

.3 All wood varieties will be in compliance with the requirements of the NLGA (National Lumber Grades Association) entitled ¨Standard Grading Rules for Canadian Lumber.¨

.4 Wood grade to be No1 or Standard in compliance with the requirements of the NLGA (National Lumber Grades Association)

.5 All wood used in the construction of the embankment will be treated with pressurized ACC in accordance with CAN/CSA-O80-M, except for ballast floor. Retention to be 24 kg/m^3 as required for marine application in accordance with requirements.

.6 The wood will be double end trimmed at a right angle before treatment following standard NLGA 748-B.

.7 All material treated under pressure requiring cutting, in order to be adjusted, will be coated, while dry, with three (3) layers of preservative as is required in standard CAN/CSA-080-M. All holes in timber pieces will be treated in this fashion.

.3 Buoyancy billets

.1 Buoyancy billets to be of extruded polystyrene foam or high density expanded polystyrene (20 psi minimum compressive applied load) and with a minimum buoyancy force of 276 kg (610 lbs)/ billet.

.4 Aluminum Gangway

.1 All items that are part of the gangway construction shall be designed and built in accordance with codes and standards, including CAN/CSA-S157/S157.1-Strength Design in Aluminum.

.2 Construction of gangway includes but is not limited to:

.1 Gangways, transition plates and guardrails will be aluminum.

.2 Installation accessories and joints.

.3 Gangway deck shall be perforated aluminum grating.

.4 Open channel.

.3 Gangway geometry:

.1 Length: 7 500 mm between supports.

.2 Free Width: 1.2 m between guardrails.

.4 Gangway shall be provided with open channel on either side of the guardrails for service ducts

.5 Gangway shall be provided with a transition plates.

.6 The materials used in the construction of bridges are:

.1 Corrosion resistant aluminum type (minimum service life of thirty years) 6061-T6 or 6005-T5-type or approved equivalent, extruded.

.2 Welding work in accordance with CAN/CSA-W59.2 and CAN/CSA-W47.2

.3 Gangway gratings to be nonslip folded aluminum, perforated and textured.

.4 Lower section wheels of Gangway to be polymer for heavy duty commercial use, stainless steel shaft at least 25 mm in diameter. A galvanized steel shaft must be installed at gangway top.

.5 A-316 Stainless Steel for all hardware, including wheel guides for 2 gangways.

.6 Hot dip galvanizing: in accordance with A653 / ASTM A653M, with zinc coating of 600 g / m².

.7 Repairs off galvanized steel components in accordance with ASTM A780 - Repairs of damaged galvanized coating.

.7 Gangway operational conditions

.1 Uniformly distributed live load of 4.8 kN/m2.

.2 Maximum deflection of L/300.

.3 Horizontal load on top of each guardrail 0.75 kN / m or 1.0 kN concentrated at any point on guardrails.

.4 Minimum service life: 30 years.

.5 Lifting rings shall be provided for handling gangway using a crane or a winch with slings.

.8 Gangway record.

.1 Record shall include shop drawings, dimensions and characteristics of all gangway components. Record shall respect all above operational conditions

.2 Record shall also indicate the type of maintenance that needs to be done on gangway to ensure their sustainability. Materials, equipment, method of handling and wintering procedures shall be provided by the supplier in its bid taking into account existing facilities and handling equipment available.

2.2 FABRICATION

.1 Where possible, works to be adjusted and built in shop, and delivered ready to fix.

Part 3 Execution

3.1 FLOATING DOCKS CONSTRUCTION

.1 Build floating docks made of treated wood to required dimensions and in accordance with drawings.

.2 All wood pieces will be of one length.

.3 Notches, holes and chamfers to be treated using an equivalent preservative product prior to wood pieces installation.

.4 To prevent damage, protect buoyancy billets during construction and handling.

.5 Floating docks will not be deposited directly on the ground. They will have to be supported by wood pieces and to be levelled.

.6 Erect Work accurately, level, plumb straight, line up and adjusted with precision, joints and crossing well fixed.

.7 Where possible, works to be adjusted and built in shop, and delivered ready to fix.

3.2

3.3 FLOATING DOCKS INSTALLATION

.1 Install floating docks in accordance with the required dimensions and as shown on details, to create configurations as shown on drawings.

3.4 FIELD QUALITY CONTROL

.1 Site Tests/Inspections:

.1 Provide Departmental Representative with minimum of 10 days notice of date of beginning Work on pontoons and provide access to Work for inspection.

.2 Pontoons constructed in whole or in part without inspection will not be accepted.

.3 Final inspection of pontoon will be made in place.

3.5 CLEANING

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

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

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM A27/A27M, Standard Specification for Steel Castings, Carbon, for General Application.

.2 ASTM A48/A148M, Standard Specification for Steel Castings, High-Strength, for Structural Purposes.

.3 ASTM A781/A781M, Standard Specification for Castings, Steel and Alloy, Common Requirements, for General Industrial Use.

.4 ASTM E186, Standard Reference Radiographs for Heavy-Walled (2 to 41/2-in. [51 to 114-mm]) Steel Castings

.5 ASTM E446, Standard Reference Radiographs for Steel Castings Up to 2 in. in Thickness

.6 ASTM E709, Standard Guide for Magnetic Particle Examination.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.61, Exterior and Interior Marine Alkyd Enamel.

.2 CAN/CGSB-1.212, Chromate and Lead Free Marine Primer for Steel and Light Alloy Surfaces.

.3 Canadian Standards Association (CSA International)

.1 CSA G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.4 Master Painters Institute (MPI)

.1 Architectural Painting Specification Manual.

1.3 SUBMITTALS

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

.2 Submit shop drawings, indicating following items:

.1 Bollards, anchors and complete hardware details with dimensions, clearance locations and direction of assemblies on structures.

.2 Locations, sizes and installation tolerances of anchor bolts.

.3 Bollards capacity.

.4 General arrangement of bollards.

1.4 WASTE MANAGEMENT AND DISPOSAL

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

Part 2 Products

2.1 MATERIALS

.1 Bollards:

.1 Grade 350W, in accordance to CSA G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 Bollards are shown on plans.

.3 Anchor bolts: to ASTM A325.

.4 Other metal parts: structural steel to CSA G40.21, Grade 350.

.5 Paint products:

.1 Execute work in accordance with Section 09 97 19 - Painting exterior metal surfaces.

.6 Non-shrink compensating grout: premixed compound consisting of non-metallic aggregate, Portland cement, water reducing and plasticizing agents.

.1 Compressive strength: 60 MPa at 28 days.

.2 Consistency:

.1 Fluid: to ASTM C827. Time of efflux through flow cone (ASTM C939), between 30 s and 50 s.

.2 Flowable: to ASTM C827. Flow table, 5 drops in 3 s, (ASTM C109, applicable portion) 125 to 145%.

.3 Plastic: to ASTM C827. Flow table, 5 drops in 3 s, (ASTM C109, applicable portions) 100 to 125 %.

.4 Dry pack to manufacturer's requirements.

2.2 INSPECTION AND CONTROL

.1 The Department reserves the right to proceed to destructive or non-destructive tests. These tests will be at Departmental Representative’s expense, unless results show that bollards are not conform to plans and specifications. Contractor will provide Departmental Representative with casting schedule.

.2 Contractor shall provide Departmental Representative with Steel Certificates for metal used in casting, testing results (traction and ductility) of test realized on each cast in conformity with ASTM A781-M-02 and all facilities required for extra testing with no extra fees for Departmental Representative.

.3 Visual and magnetic particle inspection: All bollard visible surfaces must be inspected according to ASTM E709, most recent edition. No steep section variation will be tolerated.

.1 Bollard surface must be uniform, free of sand, cracks and defection.

.2 Acceptation criteria of visual and magnetic particle inspection are based on ASME, section VIII, Division 1, Annexe 6, last edition.

.4 Radiographs: if visual inspection and/or magnetic particle inspection show defects, the based plate and neck of 1 bollard out of 3 of a similar type will be verified by X-Ray, at Contractor's expense. For each X-Rayed bollard found defective, 2 others will be processed the same way, at Contractor's expense.

.1 X-Rays must be compared to ASTM E446 (Standard Reference Radiographs for Steel Castings up to 2 in. In Thickness) or to ASTM E186 (Standard Reference Radiographs for Heavy-Walled (2 to 4.5 in. Steel Casting) depending on the thickness x-rayed. Acceptable maximum severity levels are mentioned in article 7-3 (Examination Requirements), annexe 7 (Examination of Steel Castings) from ASME, section VIII, Division 1.

.2 Acceptation criteria are from ASME, section 8, Division 1, Annexe 7, last edition. For defects of "Gas porosity" type, "Sand and Slag" and "Shrinkage", a higher level (less severe) than ASME, annexe 7, criteria will be tolerated.

.5 If controls reveal a defect, the bollard will be rejected or Contractor will propose a repairing method to Departmental Representative. If repairs are authorized, other defect inspections will be done, at Contractor's expense.

Part 3 Execution

3.1 SETTING AND GROUTING

.1 Set mooring devices at locations and elevations as indicated.

.1 After tightening of anchor bolts or positioning wedges, grout under base.

.2 Ensure that temperatures of foundation, air, base and grout are within range specified by grout manufacturer.

.2 Do not grout until location of anchor bolts and bollards have been approved by Departmental Representative.

END OF SECTION