



Fisheries and Oceans
Canada

Carleton sur mer

Reconstruction of wharf

Project n° 721198

Specifications for tender

October 2018



Fisheries and Oceans
Canada

Pêches et Océans
Canada

SPECIFICATION
FOR TENDER

CARLETON SUR MER

WHARF RECONSTRUCTION

PROJECT N°721198

MARINE WORKS⁰:

Divisions 01-02-03-05-06-09-11-31-32- Section 35 59 13.19



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CARLETON SUR MER

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Division	Section	Section Title
01 - General requirements	01 11 01	Work related General information
	01 14 00	Work Restriction
	01 29 00	Payment Procedures
	01 29 83	Payment Procedures for Testing Laboratory Services
	01 31 19	Project Meetings
	01 32 16.07	Construction Progress Schedule – Bar (Gantt Chart)
	01 33 00	Submittal Procedures
	01 35 29.06	Health and Safety Requirements
	01 35 43	Environmental Procedures
	01 41 00	Regulatory Requirements
	01 45 00	Quality Control
	01 51 00	Temporary Utilities
	01 52 00	Construction Facilities
	01 56 00	Temporary Barriers and Enclosures
	01 61 00	Common Product Requirements
	01 71 00	Examination and preparation
	01 74 11	Cleaning
	01 74 21	Construction/Demolition Waste Management and Disposal
	01 77 00	Closeout Procedures
	01 78 00	Closeout Submittals
02 - Existing conditions	02 41 16.01	Structure Demolition – Short Form
03 - Concrete	03 10 00	Concrete Forming and Accessories
	03 20 00	Concrete Reinforcing
	03 30 00.01	Cast-in-place Concrete – Short Form
	03 37 26	Underwater Placed Concrete
	03 41 00	Precast Structural Concrete
05 - Metals	05 50 00	Metal Fabrications
	05 55 00	Cathodic protection
06 - Wood, plastics and composites	06 05 73	Wood Treatment
	06 10 00	Rough Carpentry

QUEBEC REGION

09 Finishes	09 99 91	Painting
11 Equipment	11 12 00	Parking Control Equipment
26 - Electricity	26 05 00	Common Work Results For Electrical
	26 05 01	Responsibility of works
	26 05 05	Selective Demolition For Electrical
	26 05 05 A	Appendix A
	26 05 05 B	Appendix B
	26 05 05 C	Appendix C
	26 05 05 D	Appendix D
	26 05 05 E	Appendix E
	26 05 20	Wire And Box Connectors (0-1000 V)
	26 05 21	Wires And Cables (0-1000 V)
	26 05 28	Grounding - Secondary
	26 05 29	Hangers And Supports For Electrical Systems
	26 05 31	Splitters, Junction, Pull Boxes And Cabinets
	26 05 32	Outlet Boxes, Conduit Boxes And Fittings
	26 05 34	Conduits, Conduit Fastenings And Conduit Fittings
	26 05 43.1	Installation Of Cables In Trenches And In Ducts
	26 08 02	Electrical motor supply
	26 24 16.01	Panelboards Breaker Type
	26 27 26	Wiring Devices
	26 28 16.02	Moulded Case Circuit Breakers
	26 28 20	Ground Fault Circuit Interrupters - Class A and B
31 - Earthwork	31 23 33.01	Excavating, Trenching and Backfilling
	31 32 19.16	Geotextile
	31 53 13.01	Timber Cribwork
	31 62 16.13	Steel Sheet piles
32 – Exterior improvement	32 12 16.01	Asphalt paving
33 - Plumbing	33 11 16	Site water utility
35 - Waterway and marine construction	35 20 23	Excavation near ramp
	35 31 24	Stone Production
	35 31 25	Placement of Stone
	35 31 30	Articulated Concrete Block Mats
	35 59 13.19	Rubber Marine Fenders

LIST OF DRAWINGS AND DETAILS:

File Name	Titles
CIVIL	
QU-721198-C-00	SHEETS LIST
QU-721198-C-01	GEOTECHNICAL INFO
QU-721198-C-02	EXISTING CONDITIONS AND DEMOLITION PRELIMINARY WORKS PLAN VIEW
QU-721198-C-03	LOCATISATION OF ENVIRONMENTAL CHARACTERIZATION OF GROUND MATERIAL IN PLACE
QU-721198-C-04	A WHARF FACE - EXISTING CONDITIONS AND PRELIMINARY WORKS
QU-721198-C-05	F WHARF FACE - EXISTING CONDITIONS AND PRELIMINARY WORKS
QU-721198-C-06	B WHARF FACE - EXISTING CONDITIONS SECTIONS AND DETAILS
QU-721198-C-07	C WHARF FACE AREA - EXISTING CONDITIONS SECTIONS AND DETAILS
QU-721198-C-08	SPUR WHARF FACE PLAN VIEW - EXISTING CONDITIONS
QU-721198-C-09	SPUR WHARF SECTIONS - EXISTING CONDITIONS
QU-721198-C-10	SPUR WHARF ELEVATION - EXISTING CONDITIONS
QU-721198-C-11	C, D AND E WHARF FACES - EXISTING CONDITIONS DEMOLITION AND VOID CORRECTION
QU-721198-C-12	C, D AND E WHARF FACES - EXISTING CONDITIONS DEMOLITION AND VOID CORRECTION
QU-721198-C-13	EXISTING CONDITIONS - REFERENCE BLUE PRINT
QU-721198-C-14	EXISTING CONDITIONS - REFERENCE BLUE PRINT
QU-721198-C-15	SPUR WHARF EXISTING CONDITIONS - REFERENCE BLUE PRINT
QU-721198-C-16	SPUR WHARF EXISTING CONDITIONS - REFERENCE BLUE PRINT
QU-721198-C-17	PROPOSED WORKS PLAN VIEW
QU-721198-C-18	PROPOSED WORKS - LAYOUT PLAN VIEW
QU-721198-C-19	A WHARF FACE PLANNED ELEVATION VIEW AND DETAILS
QU-721198-C-20	A WHARF FACE DETAILS - F WHARF FACE PROPOSED CONDITIONS
QU-721198-C-21	B & C WHARF FACES NEW STEEL SHEET PILING PLAN & ELEVATION VIEWS
QU-721198-C-22	B AND C WHARF FACES - PLANNED SECTIONS
QU-721198-C-23	B & C WHARF FACES NEW STEEL SHEET PILING ROCH ANCHORS SECTION & DETAILS
QU-721198-C-24	B & C WHARF FACES NEW STEEL SHEET PILING DETAILS
QU-721198-C-25	B & C WHARF FACES NEW STEEL SHEET PILING DETAILS
QU-721198-C-26	B & C WHARF FACES NEW STEEL SHEET PILING DETAILS
QU-721198-C-27	B & C WHARF FACES SECTIONS & DETAILS ANCHOR WALL, LADDERS, CAP, CLEATS & FENDERS
QU-721198-C-28	C WHARF FACE- REMOVABLE WHEELGUARD SECTIONS
QU-721198-C-29	0
QU-721198-C-30	WOODEN FLOATING DOCKS
QU-721198-C-31	DETAILS FASTENING SYSTEMS FOR TYPICAL FLOATING DOCKS

QUEBEC REGION

QU-721198-C-32	DETAILS FASTENING SYSTEMS FOR TYPICAL FLOATING DOCKS
QU-721198-C-33	NEW FLOATING DOCKS PIECES - NEW ALLONGED ABUTMENT
QU-721198-C-34	E WHARF FACE- PLANNED WOODEN CRIBWORK
QU-721198-C-35	E WHARF FACE- PLANNED WOODEN CRIBWORK DETAIL
QU-721198-C-36	FINAL DETAILS

MECANIC

QU-721198-M-01	DOMESTIC WATER SUPPLY
QU-721198-M-02	DOMESTIC WATER SUPPLY
QU-721198-M-03	DOMESTIC WATER SUPPLY

ÉLECTRICIY

QU-721198-E-01	EXISTING CONDITIONS AND DEMOLITION - PLAN VIEW
QU-721198-E-02	PROPOSED LAYOUT - PLAN VIEW
QU-721198-E-03	VARIOUS
QU-721198-E-04	STRUCTURES - SECTIONNAL VIEW AND DETAILS
QU-721198-E-05	SERVICE KIOSKS - DETAILS AND NOTES

CATHODIC**PROTECTION**

PC 18-129 F1	CATHODIC PROTECTION
PC 18-129 F2	CATHODIC PROTECTION
PC 18-129 F3	CATHODIC PROTECTION
PC 18-129 F4	CATHODIC PROTECTION
PC 18-129 F5	CATHODIC PROTECTION
PC 18-129 F6	CATHODIC PROTECTION
PC 18-129 F7	CATHODIC PROTECTION

LIST OF DOCUMENTS PROVIDE WITH SPECIFICATIONS:

APPENDIX 1: Photo appendix

APPENDIX 2 : Concrete base for landing light and spotlight

END OF SECTION

Part 1 General

1.1 WORK LOCATION

- .1 Work will take place in Carleton-sur-Mer, bay chaleur region in Gaspé Peninsula

1.2 WHARF DESCRIPTION

- .1 Carleton wharf includes distinct area that have built at different times :
 - .1 A face : Sheet pile wharf built in 1988 : good condition;
 - .2 B face : Sheet pile wharf built in 1981 : important corrosion to sheet pile, perforation in tidal zone; mooring actually forbidden.
 - .3 Spur wharf : wooden crib built 1977
 - .4 C face : Sheet pile wharf built in 1981 : important corrosion to sheet pile, perforation in tidal zone;
 - .5 D face (wharf end) : Sheet pile cells built in 1965, major perforation and lost fill under slab;
 - .6 E face : Same as face B and C. An armor rock embankment is found on part of E face.
 - .7 F Face : Sheet pile covered with a steel plate.
- .2 Wharf has reach the end of its useful life and is currently under load restriction. Contractor shall consider this matter in estimation and execution of work.

1.3 WORK DESCRIPTION

- .1 The works covered by this contract include :
 - .1 Surface repair of a part of wharf;
 - .2 Painting on some wharf faces;
 - .3 Construction of new sheet pile wharf face;
 - .4 Construction of an armor rock rubble mound breakwater and of an embankment on a part of existing wharf;
 - .5 Modification and installation of existing floating docks;
 - .6 Construction of a new wooden crib;
 - .7 Construction of various surface items : slab, wall, woof decking etc.
 - .8 Supply and installation of various wharf equipment,
 - .9 Various works regarding utility services;
- .2 Actual project is considered complex in regard with many issues;
 - .1 Existing wharf in poor condition;
 - .2 Various construction method;
 - .3 Large scale works;
 - .4 Restrained area available for works;
 - .5 Tight schedule;
 - .6 Ongoing fishing activities during works;
 - .7 Marine works on a site exposed to wind, waves and tide action.

- .8 Environmental mitigation measures to consider in planning and execution.
- .3 It is expected that contractor plan ahead in a stringent way and provide with all required resources to obtain works of the highest quality.

1.4 EXECUTION OF CONTRACT

- .1 Work shall begin after reception of Notice of acceptance of offer or by agreement with the Departmental Representative.
- .2 Fishing activities will continue on wharf and access road during works, as a matter of facts :
 - .1 Works shall be executed by stages to ensure that a part of wharf remain available and usable for fishing activities, such as : boat mooring, unloading, handling, and loading in refrigerated trucks;
 - .2 Contractor shall cooperate with Fishermen's association and Departmental Representative to ensure works do not interfere with fishermen's and marina activities;
 - .3 Distinct circulation area shall be planned and separated by construction fences. A path where must be maintained for truck circulation and fishermen's vehicles.
 - .4 Floating docks available onsite must be install in front B wharf face with existing concrete blocks and chain to recover on marine bottom before march 31 2019. They must remain installed until a wharf face become available for fishermen or until fishing season is finished.
 - .5 Spur wharf must remain during fishing season because gangway to floating docks is installed on it and it acts as a breakwater. Any intervention on spur wharf shall take into account these considerations and contractor shall provide with his planning to Departmental Representative.
 - .6 Contractor shall begin works on C wharf face or on wharf head.
 - .7 Landing ramp must be accessible at the beginning and the end of the season;
 - .8 Fishing season ends at various date every year when quotas are reached. On second week of july, most activities are completed, but a minimum of 5 boat wharf places or on floating docks must be maintained;
 - .9 Loads restriction could be modified if armor rock embankment on D and E wharf face is completed.
 - .10 C wharf face must be usable before works are undertaken on B wharf face, unless fishing season is completed, or that floating dock in break water are installed. Usable means that vehicles can circulate, mooring equipment and fenders are installed.
 - .11 Temporary equipment could be suitable, given the Departmental Representative's acceptance.
 - .12 Contractor shall provide with his detailed schedule and keep it up to date during works.
 - .13 Work coordination is under contractor's entire responsibility and the later must notify at a proper deadline his intention to allow stakeholders to plan their own activities.
- .3 Construction of wharf faces shall be completed on September 15 2019

- .4 Construction of breakwater, embankment, and backfilling under slab at wharf end shall begin at fall 2018 and be 30% completed related to work cost.
- .5 All work shall be completed except for slab on November 15 2019
- .6 Concrete slab shall be completed on July 31st 2020. Construction of slab shall be done by stages, to allow for continuous use of wharf during fishing season which ends when quotas are reached, around mid August.

1.5 WORK SEQUENCE

- .1 Construct Work in stages, so as to respect the proposed schedule.
- .2 Construct Work in stages to provide for continuous users presence.
- .3 Maintain fire access/control. Equipment to prevent fires shall be provided.

1.6 SITE INSPECTION

- .1 Before submitting bid, Contractor shall be responsible to visit site and get all necessary information regarding nature and scope of the contract, as well as all the conditions that may affect the execution of the contract.
- .2 By bidding for present contract, Contractor confirms their knowledge of the nature and location of the contract, general and local conditions, especially weather or climatic conditions, wave action, tide levels, specific physical conditions at the contract site and any other situation that may affect the execution of the contract and the value of the work.
- .3 Contractor shall plan ahead for winter works in a way to properly protect structures as they are built to limit exposure to ice floe and wave action. All damage that would result from an improper planning or execution shall be at Contractor's own expenses.

1.7 CONTRACTOR USE OF PREMISES

- .1 Contractor has access to work site until Substantial Performance.
- .2 Department of fisheries and Ocean does not own any land nearby. Municipality of Carleton sur mer has a 3300m² land on *rue du quai* which could be available. Contractor will have to take an arrangement directly with city or another owner at its own expenses. A copy of the agreement shall be sent to the Departmental Representative before lot is used. No contaminated material is allowed on that land.
- .3 The use of the site is restricted to the areas needed for the execution of the contract and access routes.
- .4 The use of the premises should follow the guidelines of the Departmental Representative in such a way that works do not interfere with users activities. The Contractor shall be responsible for the safety of operations with regard to users. See section 01 56 00 - *Temporary access and protection works* for guidelines.

- .5 Prior to heavy handling and crane operations, Contractor shall provide with his work method, prepared by a professional engineer, including circulation path, lifting plan and sketches showing equipment location with regard to remaining structure. While preparing his document, Contractor shall consider that no load can spread to remaining sheet pile where fence is present.
- .6 Coordinate the use of surrounding sites following the guidelines of the Departmental Representative.

1.8 PRE-ORDERED OR SUPPLIED MATERIAL BY THE DEPARTMENTAL REPRESENTATIVE

- .1 The Departmental Representative has already placed orders with suppliers for specific material, to expedite Work and for other purposes in the Departmental Representative's interests.
- .2 The responsibilities of the Contractor regarding the storage, handling and installation of the products ordered in advance are the same as in the case of other products that he, himself, supplies.
- .3 The list of products ordered in advance are the following :
 - .1 Treated timber 254 X254 mm :
 - .1 Order placed for onsite delivery of timbers intended for crib construction excluding decking. Contractor shall provide with storage area for entire order and shall plan along with departmental Representative to unload in Carleton at his own costs. Snow removal at storage area shall be at Contractor's expenses.
 - .2 22 pieces of 9.15 m (30 ft) and 7 pieces of 6.1m (20ft) for cribwork construction are located on a DFO lot in Matane. Contractor shall recover those materials and pay for loading, shipping, unloading and storage onsite. Timbers in Matane is located in storage where snow is not removed. It is in Contractor's best interest to recover material before winter.
 - .2 Stones: Different sizes stones are stored in a quarry in Escuminac and CapSeize. Refer to measuring items for a description of those materials. Contractor shall recover those materials at his own expense.
 - .3 Floating docks: Actual docks must be recovered for works (8 out of 10). They are located on site and shall be installed temporarily to ensure business continuity then modified for use with strong arms, as opposed to chain retained as actually. Two docks left must be handed back to departmental Representative.
 - .4 Gangway : must be recovered and modified for use in present construction works.
- .4 Before work actually begins, the Contractor shall check the quantities and advise if a difference is noted.
- .5 Departmental Representative Responsibilities:
 - .1 Arrange for delivery of shop drawings, product data, samples, manufacturer's instructions, and certificates to Contractor.
 - .2 Deliver supplier's bill of materials to Contractor.
 - .3 Arrange and pay for delivery to site in accordance with Progress Schedule.
 - .4 Ensure unloading and piling in area indicated by Contractor.

- .5 Inspect deliveries jointly with Contractor.
- .6 Submit claims for transportation damage.
- .7 Arrange for replacement of damaged, defective or missing items that are not under Contractor's responsibilities.
- .6 Contractor Responsibilities:
 - .1 Designate submittals and delivery date for each product in progress schedule.
 - .2 Review shop drawings, product data, samples, and other submittals. Submit to Departmental Representative notification of observed discrepancies or problems anticipated due to non-conformance with Contract Documents.
 - .3 Inspect deliveries jointly with the Departmental Representative; record shortages, and damaged or defective items.
 - .4 Handle products at site, including unpacking and implementation.
 - .5 Protect products from damage, and from exposure to elements.
 - .6 Assemble, install, connect, adjust, and finish products.
 - .7 Provide installation inspections required by public authorities.
 - .8 Repair or replace items damaged by Contractor or subcontractor on site.

1.9 ITEMS TO BE HANDED BACK

- .1 Following demolition, following item shall be handed back to Departmental Representative or other stakeholder.
 - .1 New jersey type barrier and concrete curbs and floating docks concrete blocks and two floating docks left.
 - .1 Remove, handle and ship to Gascon on Departmental Representative 's lot on *Chemin du quai*:
 - .2 Chain link fence
 - .1 Remove, handle and store on contractor's lot in Carleton. Fence will be recovered by fishermen's Association.
 - .3 Mooring bollard
 - .1 Remove, handle and store on contractor's lot in Carleton. Bollards will be recovered by city Representative.

1.10 EXISTING UTILITY SERVICES

- .1 No services will be provided to the Contractor for execution of works. The latter shall provide their own water, electricity, etc.
- .2 Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission.
- .3 When it comes to making junction to existing networks, they should be done during hours determined by the competent local authorities, while minimizing any interference with the work sequence and/or occupants of the building and, the movement of pedestrians and vehicles.
- .4 Where Work involves breaking into or connecting to existing services, give Departmental Representative 48 hour 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. Connections must be executed by a certified electrician.

- .5 Provide alternative routes for users.
- .6 Establish location and extent of service lines in area of work before starting Work. Notify Departmental Representative of findings.
- .7 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.
- .8 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .9 Record locations of maintained, re-routed and abandoned service lines.
- .10 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.11 SITE STAKING

- .1 Fully stake out the site and ensure its complete implementation depending on the indicated location, lines and levels.
- .2 Before work begins, the Contractor shall verify all measurements on the site and notify the Departmental Representative of any errors or mismatches.

1.12 REQUIRED DOCUMENTS

- .1 Maintain at job site, one copy each document as follows:
 - .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 RELATED REQUIREMENTS

- .1 Section 01 32 16.07 – Construction progress schedule – Bar (Gantt chart)
- .2 Section 01 56 00 – Temporary barriers and enclosures

1.2 ACCESS TO WORK AREAS

- .1 Design, construct and maintain temporary access to work areas, including stairs, runways, ramps or ladders and scaffolding, 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.
- .2 Maintain existing services to building and provide for personnel and vehicle access.
- .3 Where security is reduced by work provide temporary means to maintain security.
- .4 Once the contract is completed, the existing structures that were not concerned by the work should be in the same condition, if not better than the condition it had before the work started.
- .5 Closures: protect work temporarily until permanent enclosures are completed.

1.4 SPECIAL REQUIREMENTS

- .1 Submit schedule in accordance with Section 01 32 16.07 - Construction Progress Schedule - Bar (GANTT) Chart.
- .2 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .3 Keep within limits of work and avenues of ingress and egress.
- .4 Ingress and egress of Contractor vehicles at site is limited to areas indicated on plan.
- .5 Deliver materials outside of peak traffic hours, unless otherwise approved by Departmental Representative.

1.5 INTERFERENCES ON NAVIGATION

- .1 For work done both at sea and on land, where the work is done below high water levels, the Contractor should get all the necessary information on the movements of ships and fishing activities carried out within the area concerned by the construction work. Plan and carry out works so as to avoid hindering business and fishing activities or access to maritime facilities by land or sea.
- .2 The Contractor shall continuously and accurately report all movements of his floating equipment to communications services and maritime traffic of the Canadian Coast Guard and harbour master. He shall also clearly indicate when all construction periods start and end.

- .3 The Contractor shall not moor his equipment anywhere without authorization. In case the Contractor's equipment interfere with the activities of users in any way, it could be moved at the Contractor's expense.
- .4 The Department shall not be held responsible for any loss of time, materials or equipment or any other costs caused by ships at anchor in the work area or other work carried out by the Contractor.
- .5 The Contractor shall notify the Departmental Representative forty-eight (48) hours in advance, if possible, of any special movements of his floating equipment (either for supplies, repairs, etc.).
- .6 If the Contractor's equipment happened to cause any obstruction to navigation activities, the Contractor should:
 - .1 Notify the Marine Communications and Traffic Services (MCTS) of the DFO and Departmental Representative.
 - .2 Immediately clear the equipment at his own expense. If the Contractor failed to do that, the Department will proceed with the removal of the obstacle and any costs incurred will be charged to the Contractor.

1.6 FLOATING EQUIPMENT

- .1 The Contractor shall provide sufficiently large equipment with sufficient space to carry out the work described in the plans and specifications.
- .2 In the course of the contract, all machines must be in good working condition and instantly repaired at all times. All equipment used must be able to withstand the sea and be in good condition. Their dimensions, characteristics and draught should make it possible for them to effectively do the job.
- .3 Equip floating equipment with navigation lights, in accordance with the *Canada Shipping Act*.
- .4 Ensure marine radio is monitored on ships.
- .5 Place and keep functional buoys and traffic lights throughout the duration of the contract.
- .6 The Contractor must, at his own expense, provide, install, and maintain all the buoys or marks required to effectively carry out works. If, by chance or by accident, one or more buoys/marks got stuck or went adrift, they would be bailed out and/or recovered at the expense of the Contractor to the satisfaction of the Departmental Representative. The Contractor shall be responsible for any accident caused as a result of poor visibility or disposal of buoys/marks in the day to their poor lighting at night, or for any other reason.
- .7 All marks and lights mounted on floating equipment required for work should remain functional, in accordance with "Collision Regulations" and "Navigation Safety Regulations". All the equipment needed for work must therefore be properly identified and/or visible at all times.

1.7 BUILDING SMOKING ENVIRONMENT

- .1 Comply with smoking restrictions. Smoking is not permitted.

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 MEASUREMENT METHOD

- .1 The Contractor shall, within ten (10) days after receiving an acceptance notice for the contract, provide cost breakdown for global units items.
- .2 The Contractor shall provide, within ten (10) days after receiving an acceptance notice for the contract, a list of equipment and the hourly rates for each of the equipment available for the works.
- .3 The Contractor shall, within ten (10) days after receiving an acceptance notice for the contract, provide a list of hourly rates for his staff.
- .4 The lump sum price and unit prices will include, but not limited to, leasing, equipment installation, equipment, tools, labour, administrative costs, profit, funding, expenditure for work not specifically defined either in the plan, or specifications or any other tender documents, but considered necessary so as to conform to best practices.
- .5 All work described in this specifications, or presented in the plans, or necessary for the completion of all the work specified herein, but not defined as a separate item requiring a fixed rate or unit payment, will be considered as directly or indirectly linked to the overall purpose of the contract and no separate payment will be made for any of these works; the cost of any work that is directly or indirectly linked to the aim of this contract must however be included in the unit prices quoted in the tender.
- .6 The method used to measure labour, tools or materials for the contract will be as follows:
 - .1 **Lump sum works:** such jobs will be appraised as a global unit. They include, but are not limited to:
 - .1 **Item 1 - Mobilization and demobilization**
 - .1 This item will be measured as a global unit and will include all costs related to the transportation and handling of all equipment and construction of facilities.
 - .2 This item will be paid following a 50% proportion at the beginning of the contract and 50% after premises have been returned to pre-work state and the final cleaning. If some equipment are to be demobilized before the end of the contract, a justified payment may be done upon approval from the Departmental Representative.
 - .3 Mobilization and demobilization costs of equipment for excavation near landing ramp are not included here, but in item number 3.
 - .2 **Item 2 - Site organization**
 - .1 This item will be measured as a global unit and will include, but not be limited to, the following:
 - .1 Surety and administrative charges;

- .2 Investigation, planning, management and supervision;
 - .3 Permits and request for authorization (municipal, provincial and federal);
 - .4 Management of general waste that is not included in other items;
 - .5 Connection and disconnection of temporary services (electricity, water, etc.);
 - .6 Bills for temporary public services (electricity, telephone, Internet, water, etc.);
 - .7 Supply and construction of temporary fences around construction sites and dismantling them around the different areas (construction site, assembly, storage, etc.);
 - .8 Temporary installations at construction sites;
 - .9 Tidiness at the construction site and final cleaning;
 - .10 Security services, signallers, guards, etc.;
 - .11 All components under section 01 of the specifications. It also includes works indicated in the plans and specifications for which payment was not designated in another measured item.
- .2 This item will be paid in proportion of completed work, following bid form costs or upon submission of supporting documents.

Item 3 – Dismantling and demolition

- .1 This item will be separated in sub items and each will be measured as a global unit and include, but not be limited to, the following:
- .2 Item 3.1-Dismantling :
 - .1 Dismantling of cylindrical and wooden fenders on all wharf faces.
 - .2 Dismantling of mooring bollards and cleats where new wharf faces are constructed as shown on plans and hoist, which are then handed to the departmental or city Representative whichever the case.
 - .3 Dismantling of prefabricated concrete curb and fences, which are then handed to department Representative.
 - .4 Dismantling of ladders where applicable, light post, service posts, protection posts; fabricated steel around older ramp on E wharf face.
 - .5 This item also includes disposal of non-recovered component from the demolition site, following applying regulation. When recovered components must be shipped to another site, shipping, loading and unloading fees are at contractor's charge.

.2 Item 3.2-Demolition :

- .1 This item includes demolition on all components shown on plans, without being limited to : concrete slab where required, various concrete bases except navigation tower, top of sheet pile in area of B and C wharf faces, spur wharf, coping wall and wheel guard where applicable, perimeter of older ramp prior to modification works.
- .2 This item also includes sorting, stockpiling and disposition according to applying rules for all demolished items, including spur wharf, for which creosoted wood shall be disposed and ballast stone shall be recovered. Excavation of wharf backfill is included in another item.

.4 **Item 4 – Landing light**

- .1 This item will be separated in sub items and each will be measured as a global unit and include, but not be limited to, the following:
 - .1 **Item 4.1 Removal of existing light**
 - .1 Disconnection, removal and disposal of existing tower, protection posts and cabinet.
 - .2 This item also includes demolition of concrete slab of navigation tower
 - .1 **Poste 4.2 New landing light**
 - .1 This item includes construction of a new reinforced concrete slab for post, including supply and installation of concrete, sleeves, rebar, protection for cold weather concreting and curing. Installation of anchor bolts are also included in present item. This item also includes supply and installation of electrical conduit, wiring, and help to CCG for the connection and commissioning of spot and landing light.

.5 **Item 5 - Crane**

- .1 This item will be paid following a global unit and will include supply, installation and commissioning of crane and all work required for its proper operation, including load tests onsite with users. Electrical connection is included in another item.

.6 **Item 6 – Backfilling of voids under slab at wharf head**

- .1 This item will be paid following a global unit and will include backfilling up to the level under the existing slab. It will also include all tasks to complete works properly in a way to ensure a long lasting repair : supply and installation of granular material, sealing of openings, supply and install geotextile fabric, concrete pumping as required; drilling of pits for filling and inspection, repair of slab as existing. Contractor shall provide with his method to department Representative for review before construction.

.7 **Item 7 – Modification of ramp on E face.**

- .1 This item will be paid following a global unit and will include construction of a new doweled slab and a high curb as shown on plan including supply and installation of concrete, rebar, protection for cold weather concreting , curing, dowels and studs. Removal of steel component is not included in current item.

.8 **Item 8 – Supply and installation of tie back system for sheet piles.**

- .1 This item will be separated in sub items and each will be measured as a global unit and include, but not be limited to, the following:

.1 **Item 8.1 – Supply of tie backs and waling for type 1 sheet pile, for elevation transition and for wooden crib.**

- .1 This item includes supply of tie rods, nuts, plates, tie rod support for installation, stones and geotextile for embedment of tie rods etc. This item also includes supply of waling, bolts, plates, waling support, and hardware for connection and splices etc.

.2 **Item 8.2 – Installation of tie backs and waling for type 1 sheet pile, for elevation transition and for wooden crib.**

- .1 This item includes installation of tie rods, nuts, plates, tie rod support for installation, stones and geotextile for embedment of tie rods etc. This item includes installation of waling, bolts, plates, waling support, and hardware for connection and splices etc.

.3 **Item 8.3 – Supply of tie backs and waling for type 2 sheet pile.**

- .1 This item includes supply of tie rods, nuts, plates, tie rod support for installation, stones and geotextile for embedment of tie rods etc. This item also includes supply of waling, bolts, plates, waling support, and hardware for connection and splices etc.

.4 **Item 8.4– Installation of tie backs and waling for type 2 sheet pile.**

- .1 This item includes installation of tie rods, nuts,

plates, tie rod support for installation, stones and geotextile for embedment of tie rods etc. This item includes installation of waling, bolts, plates, waling support, and hardware for connection and splices etc.

.5 **Item 8.5 – Dead men for type 1 sheet pile, for elevation transition and for wooden crib..**

- .1 This item includes supply of concrete, rebar, embedded hardware in concrete, material for joints. It also includes concrete curing and cold weather concreting.

.6 **Item 8.6 – Dead men for type 2 sheet pile.**

- .1 This item includes supply of concrete, rebar, embedded hardware in concrete, material for joints. It also includes concrete curing and cold weather concreting.

.7 **Item 8.7 – Rock anchors**

- .1 This item includes supply and installation of anchors, more specifically drilling, emptying of drilling holes, caisson water tightness, centering devices, concrete pouring, mitigation measures for suspended matter control and removal of excess concrete if applicable.

8.7.1 Anchors for type I sheet pile and elevation transition.

8.7.2 Anchors for type II sheet pile

.9 **Item 9- New sheet pile junction to existing wharf**

- .1 This item will be separated in sub items and each will be measured as a global unit and include, but not be limited to, the following:

.1 Item 9.1 – Junction of B face sheet pile to existing A face Sheet pile.

- .1 It includes all onsite measurements, fabrication, installation and works, including diving, required to complete this item.

.2 Item 9.2 – Junction of C face sheet pile to existing C face Sheet pile.

- .1 It includes all onsite measurements, fabrication, installation and works, including diving, required to complete this item.

.10 **Item 10- Wooden cribs of E face**

- .1 This item will be paid following a global unit and will include supply of hardware, construction, handling and installation of wooden cribs and installation of ballast stones, as shown on plans. It also includes survey of crib foundation prior to installation and wood decking in crib limits. It also includes

related components; ladders; sheathing etc. Wheel guard and decking are not included in actual item. Timbers and ballast stones are provided by departmental Representative. This items includes the reuse, transport and the placing in cribs of 2 950 tm of man stones from the Cap-Seize quarry.

.11 **Item 11- Concrete slab**

- .1 This item will be separated in sub items and each will be measured as a global unit and include, but not be limited to, the following:
 - .1 **Item 11.1 Concrete slab foundation**
 - .1 This item includes supply and installation of granular material of foundation. It also includes grading and compaction.
 - .2 **Item 11.2 Concrete slab**
 - .1 This item includes supply and installation and finishing of concrete, rebar, material and labor for construction of joints and saw cuts. It also includes dowels, fittings for utility; material and labor for curing and cold weather concreting etc. Slab for wharf face B, C and E and on wharf head by the wall and wooden crib are included in actual item.

.12 **Item 12- Concrete bases**

- .1 This item will be paid following a global unit and will include supply and installation of new concrete bases shown on plans for crane; light posts; service posts etc.. It includes supply and installation of granular foundation, concrete, rebar, pipe fittings, dowel, curing, cold weather concreting etc.

.13 **Item 13- Concrete wall**

- .1 This item will be paid following a global unit and will include supply; installation and concrete finishing, rebar and material and labor for joints. It also includes cold weather concreting and all what is required to complete this item. Measuring of this item is done from slab over thickness.

.14 **Item 14- Utility services**

- .1 This item will be separated in sub items and each will be measured as a global unit and include, but not be limited to, the following:
 - .1 **Item 14.1 Water supply**
 - .1 This item includes supply and installation of water pipes. It includes hardware, valves, junction, disinfection and testing prior to commissioning. It also includes bleeding system to drain pipes and all what is required to complete this item.
 - .2 This item also includes junction and

coordination required with city of Carleton-sur-mer.

.2 Item 14.2 Electrical system

- .1 This item includes supply and installation of all components of electrical system for power supply to services posts, lighting posts, light pedestals, crane, landing light, floating docks etc. It includes cabinet, service posts; pipes, cables, panels, junction boxes, fixture, light pedestal, light posts, grounds, pulling boxes and all hardware. It also includes junction to panels and equipment (crane, light post, light pedestals except landing lights), testing and commissioning.
- .2 This item includes test and junction to Hydro Québec network.

.3 Item 14.3 Civil works related to electricity and water supply

- .1 This item includes excavation and backfilling works for installation of buried components of water supply and electricity systems. Paving is in another item.

.15 Item 15- Geotextile

- .1 This item will be paid following a global unit and will include supply; installation of geotextile fabric between backfilling material and various foundation for slabs, bases etc. and also against sheet pile where new embankment and cribs is present, and also in all trenches in the breakwater. Overlapping is included and no additional payment will be done.

.16 Item 16- Cathodic protection

- .1 This item will be paid following a global unit and will include supply and installation of all components of cathodic protection system, including anodes, reference anodes, corrosion coupons, cables, cabinets and all hardware and accessories.
- .2 Underwater and welding works are also included in actual item.

.17 Item 17- Wharf equipment and miscellaneous

- .1 This item will be separated in sub items and each will be measured as a global unit and include, but not be limited to, the following:

.1 Item 17.1 – Rubber fenders

- .1 This item includes supply and installation of fenders, fabricated metal, hardware etc.

.2 Item 17.2 - Ladders for sheet pile wharf

- .1 This item includes supply and installation of ladders, hand grips, hardware, etc. This item is related to ladders on B and C faces and new ladders on top of repair plates on A face.
- .3 **Item 17.3 - Mooring cleats.**
 - .1 This item includes supply and installation of cleats on coping wall.
- .4 **Item 17.4 – Coping wall.**
 - .1 This item includes supply and installation of fabricated steel required for construction of coping wall. .
- .5 **Item 17.5 – Wooden wheel guard.**
 - .1 This item includes supply and installation of fabricated steel required for construction of wheel guard (C, D and E faces), besides 10 X10 timbers. It includes supply and installation of fabricated metal, hardware, timbers etc.
- .6 **Item 17.6 – Removable wheel guard for breakwater access.**
 - .1 This item includes supply and installation of fabricated metal for wheel guard and support embedded in slab, hardware and galvanizing. .
- .7 **Item 17.7 –Protection posts.**
 - .1 This item includes supply and installation of protection posts, painting, galvanizing, hardware etc.
- .8 **Poste 17.8 – Hand rail on concrete wall**
 - .1 This item includes supply and installation of fabricated metal, hardware and galvanizing.
- .9 **Poste 17.9 – Wooden decking**
 - .1 This item includes supply and installation of wooden decking on area shown on plans and all related components and hardware.
- .10 **Poste 17.10 – Pavement**
 - .2 This item includes supply and installation of pavement where trenches have been excavated to install utility services.

- .2 **Unit price works:** The quantities indicated in the price list are estimated quantities and they can only be increased after a written authorization from the Departmental Representative. No payment shall be made for any additional quantities if the Contractor does not receive prior written authorisation from the Department. Such work is subjected to a unit price agreement and includes, but is not limited to:

- .1 **Item 18 - Excavation:** On the unit price table, this item shall be broken down into different sub units.

.1 **Item 18.1 – Excavation and stockpiling of recovered material.**

- .1 This item includes excavation of all granulat material required prior to installation of new component of wharf, that will be recovered as backfill in new wharf. Recovery shall be in accordance with environmental characterization report and must be optimized to reduce quantity of new material to provide.
- .2 This item includes separated stockpiling of contaminated and non contaminated material according to applying environmental regulations by the time it is used as backfill.

.2 **Item 18.2 – Excavation and disposal.**

- .1 This item shall be broken down into different sub units and will include excavation, stockpiling, handling, transport and disposal of material that will not be recovered in work. It also includes means to drain material and water treatment according to applying environmental regulations.

.2 **Item 18.2.1 – Excavation, transport and disposal of contaminated material between A and B criteria**

.2 **Item 19 – Sheet pile repair on A face :**

- .1 This item will be paid by the square meter and will include supply and installation of all component required for repair : surface preparation; fabricated metal; hardware; sheet pile sealing as required; formwork waterproofing; concrete and all related components to complete work.

.3 **Item 20- Penetration test to sea bottom**

- .1 This item will be paid by the unit and include penetration tests prior to sheet pile order to determine final roc elevation on B and C wharf face at 10m spacing maximum. If there is a doubt between refusal and roc level, perform new tests nearby. Provide with a report of these tests describing all relevant information. If these tests are not performed, splicing of sheet pile supply and installation of additional quantities will be paid by contractor.

.4 **Item 21 – Supply of sheet piles:**

- .1 This item will be paid by the square meter of sheet pile pairs and includes supply, transport, handling of sheet piles. It also includes sheet pile for caisson and fabrication and 300mm for cut off at top of sheet piles that is not included in paid quantities. Quantities for this item are based on boreholes that reached bedrock. Because few boreholes are available, it is mandatory that penetration tests are performed by contractor, to determine level of bedrock before order is placed. **For sheet pile, square meter on unit table are measured on a vertical plane and includes wheel guard**
- .2 On unit price table, this item will be broken down into different sub units.
 - .1 Item 21.1 – Supply of sheet pile on B face (type II)
 - .2 Poste 21.2 – Supply of sheet pile on C face (type I)

.5 **Item 22 –installation of sheet piles:**

- .1 This item will be paid by the square meter of sheet pile pairs and includes installation of sheet piles, cut off, templates, pile cap, preparation of a pile driving logbook and all item and activity required for sheet pile installation. Quantities for this item are based on boreholes that reached bedrock. Because few boreholes are available, it is mandatory that penetration test are performed by contractor, to determine level of bedrock before order is placed. **For sheet pile, square meter on unit table are measured on a vertical plane and includes wheel guard.** Item also includes works related to drainage
- .2 On unit price table, this item will be broken down into different sub units.
 - .1 Item 22.1 – Supply of sheet pile on B face (type II)
 - .2 Poste 22.2 – Supply of sheet pile on C face (type I)

.6 **Item 23 –Surface preparation prior to painting of A and F faces :**

- .1 This item will be paid by the square meter. It includes surface preparation, recovery and disposal of paint residues, construction of working platform if required and all related activities to carry out such work. This item includes work for sheet piles over repair plates of A and F faces, repair plates on F faces and wheel guards on A and F faces and also wharf accessories on A and F faces. **For sheet pile, square meter on unit table are measured on a vertical plane and includes wheel guard.**

.7 **Item 24 –Painting of A, B, C and F faces :**

- .1 This item will be paid by the square meter. It includes painting of sheet pile repair plates and also existing and new sheet pile. It also includes painting of wheel guard on A, B, C and F and wharf equipment. **For sheet pile, square meter on unit table are measured on a vertical plane and include wheel guard.** It includes supply and labor for painting and all related tasks

required by manufacturer, protection against bad weather, etc.

.8 **Item 25 – Backfilling of wharf :**

- .1 This item includes backfilling of wharf and will be paid by the installed cubic meters. It includes handling and placing of recovered material from excavation that was previously stockpiled.

.9 **Item 26 – Removal of excess quarry run**

- .1 This item will be measured in theoretical cubic meters of dredged material, based on bathymetric surveys by contractor, before and after works. See section 35 20 23 - Dredging, in specification, for more details on this item.
- .2 Other considerations related to these works:
 - .1 Only materials excavated above the level of the required depth and below the indicated or required side slopes will be measured.
 - .2 The Contractor shall use the most appropriate equipment to maximise effectiveness of excavation.
 - .3 There will be no additional payment for the installation, maintenance and removal of warning buoys marking work zones.
 - .4 There will be no additional payment for waste of time caused by the buoys movement in work areas.
 - .5 There will be no additional payment for the docking and anchorage fees for equipment or any other floating equipment.
 - .6 There will be no additional payment for downtime resulting from operational adjustments in performance.
 - .7 Activities that fall in line with the installation of equipment and, the Contractor's equipment and crew will not be paid separately, but will be considered as part of the excavation exercise.
 - .8 Filling and settling may occur before the reception of works in areas where the excavation is not completed, or that were previously excavated. The Contractor shall be responsible for clearing the material and completing the excavation of all areas indicated on the plan at the specified depth in view of obtaining the "Certificate of Completion". The removal of carried material during excavation will not be measured separately for payment.
 - .9 No additional payment will be made as a result of delays from shipping, at a downtime due to lack of coordination between the contractor and the users.
 - .10 No additional payment will be made due to delays or downtime caused by shipping.
 - .11 No additional payment will be made due to delays caused by environmental constraints.

- .12 The excavation of material that is carried in the dredging area will not be measured for payment.
- .3 Item 26.1 - Excavation of quarry run:
 - .1 Excavation will be measured per cubic meters of excavated material present, according to surveys conducted before and after works by the Departmental Representative. This item will include costs for labour, machinery, transportation and required equipment, as well as any other work not specifically described, but required to carry out such work, following the plans and specifications.
- .4 Item 26.2 – Managing, transportation and disposal of excavated material:
 - .1 This item will be measured in metric tons of materials, based on scale receipts. Payment will include transportation, management and disposal of excavated material to authorized soil disposal site, approved by the Departmental Representative. The management of excavated material will not be paid separately and will be included in the unit price per ton. The use of sealed bins and drying of materials, will not be paid separately and will be included in the unit price. This item will include costs for labour, machinery, transportation and required equipment, as well as any other work not specifically described, but required to carry out such work, following the plans and specifications. On the unit price table, this item shall be broken down as follows:
- .10 Item 27 - Foundation for cribs
 - .1 This item will be measured in theoretical cubic meters installed, based on bathymetric surveys by contractor and will include the cost for all labour, machinery, transportation and materials needed to lay the foundation of the wooden on the seabed, as well as levelling. It will also include the following production activities: sorting and sifting, transportation, weighing and mixing of granular material and stones for the construction of the foundation for wooden cribs and other work not specifically described but required to carry out such work in following the plans and specifications. On the unit price table, this item shall be broken down as follows:
 - .1 Item 27.1 – 25-150 mm stones
 - .2 Item 27.2 – 150- 400 mm stones.
- .11 Item 28 - Articulated Concrete Block Mats (ACBM)
 - .1 This item will be measured per meter square and will include the placement of articulated concrete block mats and its foundations on the structure, following the limits specified in the plan. The tendered price will include the cost for all labour, machinery, transportation and materials needed for the supply and

installation of articulated concrete block mats, including, among other things, but not limited to, ACBMs and attachment system, foundations, as well as any other job not specifically described but required to carry out such work following the plans and specifications.

.12 **Item 29 – Rock armored embankment and break water**

.1 **Item 29.1 – New stones**

- .1 This item will be measured per metric ton installed for each category of stones and will include, but not be limited to, costs for production and supply of materials, transportation, labour and equipment required for construction of new rock armour breakwater and embankment of wharf. It also includes any other work not specifically described, but required to carry out such work, following the plans and specifications. On the unit price table, this item shall be broken down as follows:

.1 Item 29.1.1 – 5 to 9 tonnes sized stones

.2 Item 29.1.2 – 4 to 7 tonnes sized stones

.3 Item 29.1.3 – 3 to 5 tonnes sized stones

.4 Item 29.1.4 – 2 to 4 tonnes sized stones

.5 Item 30.1.5 – 500 to 900 kg sized stones

.6 Item 29.1.6 – 400 to 700 kg sized stones

.7 Item 29.1.7 – Quarry run stones.

.1 **Item 29.2 – Stones provided by departmental Representative**

- .1 This item will be measured per metric ton installed for each category of stones and will include, but not be limited to, costs for, transportation, labour and equipment required for installation of stones in work. It also includes any other work not specifically described, but required to carry out such work, following the plans and specifications. It must be considered that all material must be transported from site before November 15 2019.

- .1 Item 29.2.1 Quarry run : to be transported from Escuminac quarry : (15 000 mt) and reused in breakwater.
- .2 Item 29.2.2 Ballast stones (300 mm to 500 mm) : to be transported from quarries Cap-Seize (4 750 tm) and Escuminac (200 tm). A total of 6 750 tm of man stones must be reused in the breakwater in stone categories 0.2-0.4 tm (+- 1 570 tm), 0.3-0.5 tm (2620 tm) , 100-500 kg under concrete mattress (+- 350 tm) and the balance must be reused in the quarry run (2200 tm).

.13 **Item 30 – Floating docks system**

- .1 This item shall be broken down into different sub units :
 - .1 30.1 Temporary services :
 - .1 This item includes take over of ten existing docks and installation onsite for temporary setup on wharf face B. This item includes also installation of existing anchor arm on dock #1 and installation of gangway. The item includes the removal of all dock system (docks, blocks, chains, arms) and the gangway at the end of the temporary service period.
 - .2 30.2 Strong arms :
 - .1 This item includes supply, transport and installation of dock's anchor arms, all related hardware and required adjustments.
 - .3 30.3 Anchor blocks :
 - .1 This item includes supply, transport and installation of anchor blocks in break water, foundation and required adjustment.
 - .4 30.4 Floating docks modification
 - .1 This item includes labor, hardware, material and transport required to recover existing docks and modify them according to plans and specifications
 - .5 30.5 New floating docks installation
 - .1 This item includes take over of existing docks that have been installed for temporary setup, their removal, their storage if required and final installation according to plans and specifications.
 - .6 30.6 Gangway anchor block
 - .1 This item includes supply, transport, and installation of concrete block in breakwater, foundations and required adjustment.

CARLETON SUR MER
Reconstruction of wharf
Project: 721198

Section 01 29 00
PAYMENT PROCEDURES
Page 15 of 15

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Division 01 – General requirements
- .2 Particular requirements for inspection and testing to be carried out by testing laboratory designated by Departmental Representative are specified under divisions and sections as follows:
 - .1 Division 03 – Concrete
 - .2 Division 31 – Earthwork
 - .3 Section 35 31 24 – Stone production

1.2 APPOINTMENT AND PAYMENT

- .1 Departmental Representative will appoint and pay for services of testing laboratory for its own requirements
- .2 The Contractor will have to supply and pay the expenses for laboratory testing for quality insurance and more particularly for what follows: Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
 - .1 Inspections and tests requested by laws, prescriptions, rules, regulations or public instructions.
 - .2 Tests and certificates of compliance for aggregates, concrete mixture, products of treatments of the wood, etc.
 - .3 Certificates of compliance of aggregates sources of supply.
 - .4 Inspection and testing performed exclusively for Contractor's convenience and its own suppliers and subcontractors.
 - .5 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.
 - .6 Mill tests and certificates of compliance.
 - .7 Tests specified to be carried out by Contractor under supervision of Departmental Representative.
- .3 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.

1.3 CONTRACTOR'S RESPONSIBILITIES

- .1 Provide labour, equipment and facilities to:
 - .1 Provide access to Work for inspection and testing.
 - .2 Facilitate inspections and tests.
 - .3 Make good Work disturbed by inspection and test.
 - .4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.

- .2 Notify Departmental Representative 48 hours minimum 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 RELATED REQUIREMENTS

- .1 Section 01 32 16.07 – Construction progress schedule – Bar (Gantt chart)
- .2 Section 01 35 29.06 – Health and safety requirements
- .3 Section 01 51 00 – Temporary utilities
- .4 Section 01 52 00 – Construction facilities
- .5 Section 01 56 00 – Temporary barriers and enclosures

1.2 ADMINISTRATIVE

- .1 Schedule and administer project meetings throughout the progress of the work according to schedule or at the call of Departmental Representative.
- .2 Contractor provides physical space and make arrangements for meetings.
- .3 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.
- .4 The Departmental Representative will:
 - .1 Prepare agenda for meetings and send to participants and interested parties, at least one (1) day prior to the meeting.
 - .2 Chair project meetings.
 - .3 Write down minutes of meetings. Indicate all important questions and decisions therein. Specify the actions taken by the different parties.
 - .4 Distribute the minutes of meetings to members, members absent from meetings, within five (5) days after the meeting.

1.3 PRECONSTRUCTION MEETING

- .1 Within 15 days after notice of acceptance of offer, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
- .2 Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.
- .3 Establish time and location of meeting and notify parties concerned minimum five (5) days before meeting.
- .4 Agenda to include:
 - .1 Appointment of official representative of participants in the Work.
 - .2 Schedule of Work: in accordance with Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart.
 - .3 Schedule of submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.

- .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 51 00 – Temporary Utilities; 01 52 00 - Construction Facilities and 01 56 00 – Temporary Barrier and Enclosure.
- .5 Delivery schedule of equipment.
- .6 Site security in accordance with Section 01 35 29.06 – Health and Safety Requirements and Section 01 56 00 - Temporary Barriers and Enclosures.
- .7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
- .8 Departmental Representative provided products.
- .9 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .10 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
- .11 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.
- .12 Monthly progress claims, administrative procedures, photographs, hold backs.
- .13 Appointment of inspection and testing agencies or firms.
- .14 Site inspection, with a report on any damages.

1.4 PROGRESS MEETINGS

- .1 The Departmental Representative will establish, with the collaboration of the Contractor, a schedule for meetings to be held every three (3) weeks in the course of work and two (2) weeks before to the completion of the latter.
- .2 The schedule for meetings can be modified depending on the progress of work and needs, with the consent of the various parties.
- .3 Contractor, major Subcontractors involved in Work and Departmental Representative are to be in attendance.
- .4 Agenda to include the following:
 - .1 Review, approval of minutes of previous meeting.
 - .2 Review of Work progress since previous meeting.
 - .3 Shop drawings and product samples.
 - .4 Field observations, problems, conflicts.
 - .5 Problems which impede construction schedule.
 - .6 Review of off-site fabrication delivery schedules.
 - .7 Corrective measures and procedures to regain projected schedule.
 - .8 Revision to construction schedule.
 - .9 Progress schedule, during succeeding work period.
 - .10 Review submittal schedules: expedite as required.
 - .11 Maintenance of quality standards.
 - .12 Review proposed changes for affect on construction schedule and on completion date.
 - .13 Other business.

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 five 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.
- .10 Critical path: this is a sequence of activities that determines the duration of the project. The critical path is usually the longest path between the beginning and end of the project.
 - .1 The critical path is usually the one for which all activities have a margin lower than or equal to a certain value, often set to zero.

1.2 REQUIREMENTS

- .1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.
- .2 Plan to complete Work in accordance with prescribed milestones and time frame.
- .3 Limit activity durations to maximum of approximately [10] working days, to allow for progress reporting.

- .4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.
- .5 Ensure that the planning process is repeated and that it always leads to a downward treatment, with additional details as planning goes on and decisions made with regard to the options and extra/replacement solutions.
- .6 Ensure the implementation timetable is respected through a close follow-up of the works to ensure integrity of the critical path, comparing the actual progress of individual activities with the expected progress; review the progress of incomplete ongoing activities.
- .7 Carry out frequent checks so as to immediately detect the causes of delays and eliminate them.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to Departmental Representative within fifteen (15) working days of Notice of Acceptance of Offer, Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.
- .3 Submit Project Schedule to Departmental Representative within five (5) working days of receipt of acceptance of Master Plan.

1.4 PROJECT MILESTONES

- .1 Project milestones form interim targets for Project Schedule.
- .2 Milestones include all main stages of various work parts.

1.5 MASTER PLAN

- .1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).
- .2 Departmental Representative will review and return revised schedules within five (5) working days.
- .3 Revise impractical schedule and resubmit within five (5) working days.
- .4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.6 PROJECT SCHEDULE

- .1 Develop detailed Project Schedule derived from Master Plan.
- .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
 - .1 Start up Meeting
 - .2 Shop Drawings, Samples
 - .3 Permits
 - .4 Mobilization and installation on the site

- .5 Temporary access and protection
- .6 Demolition
- .7 Wharf head repair;
- .8 Sheet piles repairs;
- .9 Supply and installation of sheet piles;
- .10 Supply and installation of tie rod and deadmen;
- .11 Sheet pile rock anchors;
- .12 Armoured rock embankment and breakwater;
- .13 Removal of excess quarry run;
- .14 Laying of foundation for cribs;
- .15 Construction; launching and ballasting of cribs;
- .16 Final filling of cribs;
- .17 Wharf surface items (slab, wall);
- .18 Painting;
- .19 Electrical supply system installation; testing and activation;
- .20 Installation of various elements
 - .1 Lighting
 - .2 Fenders
 - .3 Ladders
 - .4 Mooring bollards
 - .5 Cathodic protection
- .21 Rectification of errors
- .3 The detailed implementation schedule must include at least the following important points:
 - .1 Mobilization.
 - .2 Sub-contractors mobilization if necessary
 - .3 Bathymetric surveys
 - .1 Before and after dredging
 - .2 After the laying of foundation
 - .4 Disconnection of public services if necessary
 - .5 Provisional delivery of the project.
 - .6 Handing over of documents (manual, annotated plans for TQC, etc).
 - .7 Final delivery of the project.
- .4 Clearly identify the detailed implementation schedule, the critical path of the works and ensure strict monitoring so as to respect it.

1.7 PROJECT SCHEDULE REPORTING

- .1 Update Project Schedule once in a week, reflecting activity changes and completions, as well as activities in progress.
- .2 Provide an updated copy of the schedule to the Departmental Representative two (2) days prior to each meeting on the site or at the request of the Departmental Representative.
- .3 Once every month, with each progressive count, provide Departmental Representative with a detailed report which situates progress of work, compares the progress with the baseline schedule and presents current projections, anticipated delays, the impact of these factors and possible mitigating measures.

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

Part 1 General

1.1 REFERENCES

- .1 Not used.

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 drawings stamped and signed by professional engineer registered or licensed in Quebec.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .4 Allow five (5) days for Departmental Representative's review of each submission.

- .5 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.
- .6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.
- .7 Accompany submissions with transmittal letter, in two (2) copies, containing:
 - .1 Date
 - .2 Project title and number
 - .3 Contractor's name and address
 - .4 Identification and quantity of each shop drawing, product data and sample
 - .5 Other pertinent data
- .8 Submissions include:
 - .1 Date and revision dates
 - .2 Project title and number
 - .3 Name and address of:
 - .1 Subcontractor
 - .2 Supplier
 - .3 Manufacturer
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances
 - .3 Setting or erection details
 - .4 Capacities
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.
- .9 After Departmental Representative's review, distribute copies.
- .10 Submit one (1) electronic copy and four (4) prints of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
- .11 Submit one (1) electronic copy 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.

- .12 Submit one (1) electronic copy of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
 - .2 Testing must have been within three (3) years of date of contract award for project.
- .13 Submit one (1) electronic copy 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.
- .14 Submit one (1) electronic copy of manufacturer's instructions for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .15 Submit one (1) electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.
- .16 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .17 Submit one (1) electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.
- .18 Delete information not applicable to project.
- .19 Supplement standard information to provide details applicable to project.
- .20 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, electronic copy will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .21 The review of shop drawings by Department representative is for sole purpose of ascertaining conformance with general concept.
 - .1 This review shall not mean that Departmental representative approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
 - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.4 SAMPLES

- .1 Submit for review samples in two (2) as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to Departmental Representative's site office.
- .3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Where colour, pattern or texture is criterion, submit full range of samples.
- .5 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .6 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.5 MOCK-UPS

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

1.6 PHOTOGRAPHIC DOCUMENTATION

- .1 Submit electronic copy of colour digital photography in jpg format, standard resolution monthly with progress statement.
- .2 Project identification: name and number of project and date of exposure indicated.
- .3 Number of viewpoints: four (4) locations.
 - .1 Viewpoints and their location as determined by Departmental Representative.
- .4 Frequency of photographic documentation: weekly or as directed by Departmental Representative.
 - .1 Upon completion of: framing and services before concealment or as directed by Departmental Representative.

1.7 CERTIFICATES AND TRANSCRIPTS

- .1 Immediately after award of Contract, submit Workers' Compensation Board status.
- .2 Submit transcription of insurance immediately after award of Contract.

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 REQUIREMENTS

- .1 Section 01 33 00 – Submittal procedures

1.2 REFERENCES

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations (L.R.Q. c. S-2.1)
- .2 Province of Quebec, an Act Respecting Occupational Health and Safety (L.R.Q., c.S-2.1 current edition) - Updated 2016.
- .3 Canada Shipping Act, 2001- Collision Regulations (C.R.C., ch.1416).
- .4 Workplace Hazardous Materials Information System (WHMIS)
- .5 CAN/CSA-Z259.10-12 – Full body harnesses
- .6 CAN/CSA-Z460-13 – Control of hazardous energy - Lockout and other methods
- .7 CAN/CGSB-65.7-2007 – Life Jackets
- .8 CAN/CSA-Z275.2 - Occupational safety code for diving operations

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to Departmental Representative the site-specific Health and Safety Plan: Within seven (7) days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Commitment of the management and the workers to the health and the safety.
 - .2 Policy of the company regarding health and safety.
 - .3 Results of site specific safety hazard assessment.
 - .4 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
 - .5 Procedures in case of accidents/incidents.
- .3 Weekly submit two (2) copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative.
- .4 Submit to Departmental representative within 24 hours a copy of any inspection report, correction notice or recommendation issued by Federal, Provincial and Territorial health and safety inspectors.
- .5 Submit to Departmental representative within 24 hours an investigation report for any accident or incident.
- .6 Submit WHMIS MSDS - Material Safety Data Sheets if needed. Contractor must also keep one copy of these documents on the construction site.
- .7 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within ten (10) days after receipt of plan.

- Revise plan as appropriate and resubmit plan to Departmental Representative within ten (10) days after receipt of comments from Departmental Representative.
- .8 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
 - .9 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.
 - .10 Submit to Departmental Representative copies of all training certificates required for the application of the prevention program, in particular (if applicable) for the following:
 - .1 First aid in the workplace and cardiopulmonary resuscitation;
 - .2 Work in confined spaces;
 - .3 Lockout-tagout procedures;
 - .4 Wearing and adjustment of personal protective equipment;
 - .5 Any other training requirement of Regulations or the safety program.
 - .11 Engineer's plans and certificates of compliance: Contractor must submit to the Departmental representative and to the *Commission des normes, de l'équité, de la santé et de la sécurité du travail* (CNESST) a copy signed and sealed by engineer of all plans and certificates of compliance required pursuant to the *Code de sécurité pour les travaux de construction* (S-2.1, r.4) (Safety code for the construction industry) or by any other legislation or regulation or by any other clause in the specifications or in the contract. The Contractor must also submit a certificate of conformity signed by an engineer once the facility for which these plans were prepared has been completed and before a person uses the facility. A copy of these documents must be available on site at all times.
 - .1 Any modification in an equipment or a part of machinery which was not authorized in writing by the manufacturer. A copy of these documents must be available any time on the work site.
 - .12 Submit to Departmental Representative an on-site Emergency Response Plan. The Emergency Response plan must be distributed to all concerned persons as listed in the article « 1.3 Action and Informational Submittals. » The plan must contain :
 - .1 The procedure of evacuation;
 - .2 Identification of the resources (police, fire brigades, ambulances, etc;
 - .3 Identification of the on-site's persons in charge;
 - .4 Identification of the first-aid workers;
 - .5 The training required for the people responsible for his application ;
 - .6 And any other information which would be necessary, considering the characteristics of the working construction site / place.
 - .13 Submit all the documents relative to diving works.

1.4 COMMISSION DES NORMES, DE L'ÉQUITÉ, DE LA SANTÉ ET DE LA SÉCURITÉ DU TRAVAIL DU QUÉBEC (CNESST)

- .1 Comply with the *Loi sur la santé et la sécurité du travail* (L.R.Q., c. S-2.1) (Act Respecting Occupational Health and Safety) and the *Code de sécurité pour les travaux de construction* (S-2.1, r. 4.) (Safety code for the construction industry) in addition to respecting all the requirements of this specification manual.

1.5 FILING OF NOTICE OF CONSTRUCTION SITE OPENING

- .1 Before works begin, submit notice to the competent provincial authorities.
- .2 Notice of site opening: Notice of site opening shall be submitted to the CNESST before work begins. A copy of such notice shall be submitted to Departmental Representative at the same time and another posted in full view on the worksite. At demobilization, a notice of site closing shall be forwarded to CNESST with copy to Departmental Representative.
- .3 The Contractor shall assume the role of being the Primary Contractor in the limits of the construction site and elsewhere where he must execute work within the framework of this project. The Contractor shall recognize the responsibility of being the Principal Contractor of the project and identify himself as such in the notice of the construction site opening he provides to the CNESST.
- .4 Works will take place in zones below:
 - .1 Defined on plans.
- .5 The Contractor shall accept to divide and identify the construction site adequately in order to define time and space at all times throughout the course of the project.

1.6 CERTIFICATION OF COMPLIANCE (CNESST)

- .1 Certification of compliance delivered by CSST: the certification of compliance (Attestation de conformité) is a document issued by CSST to confirm that the Contractor is in good standing with CSST, that is, all amounts owing to CSST with respect to a given contract have been paid. The document shall be submitted to the Departmental Representative at work completion.

1.7 EVALUATION OF RISKS/DANGERS

- .1 Contractor must proceed to an identification of the dangers relative to each of the tasks carried out on the working construction site / place.
- .2 Plan and organize work so as to eliminate the risk of fall at the source or ensure collective protection, thereby minimizing the use of personal protective equipment. When personal fall protection is required, workers must use a safety harness that complies with CSA standard CAN/CSA Z-259.10 M90. A safety belt must not be used as fall protection.
- .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 (for example, but not limited to: hoisting devices for persons or materials, excavators, concrete pumps, concrete saws) shall be inspected before

delivery to the construction site. Before using any mechanical equipment, the Contractor shall obtain a certificate of compliance signed by a qualified mechanic dated less than a week prior to the arrival of each piece of equipment on the construction site; the certificate shall remain on the construction site and transmitted to the Departmental representative. The Departmental representative can at all times, if he suspects a malfunction or the risk of an accident, order the immediate stop of any piece of equipment and require an inspection by a specialist of his choice.

1.8 MEETINGS

- .1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

1.9 REGULATORY REQUIREMENTS

- .1 Do Work in accordance with Section 01 41 00 - Regulatory Requirements.

1.10 RISK INHERENT TO THE WORK SITE

- .1 In addition to the risks related to the tasks to be carried out, personnel responsible for the execution of the work on the construction site will be exposed to the following risks, inherent to the area where the work will be executed:
 - .1 Works in quarry on production and stone sorting
 - .2 Ground transportation and stones transshipment, concrete blocks and massive timber elements, assembled or not.
 - .3 Sea transport and maritime construction work, on the floating material, the operation involving risks of drowning and the work near heavy equipment used for the implementation of stone, concrete blocks and wooden elements
 - .4 Works exposed to the variable weather conditions, among which the heat, the cold, the winds, the rain, the snow, etc.
 - .5 Demolition works.
 - .6 Diving works

1.11 GENERAL REQUIREMENTS

- .1 Before undertaking the work, prepare a site-specific prevention program based on the hazards identified according to the article "HAZARD ASSESSMENT" and the article "RISKS INHERENT TO THE WORKSITE" in this section. Apply this program in its totality from the start of the project until demobilization of all personnel from the construction site. The prevention program shall take into consideration the specific characteristics of the project and cover all the work to be executed on the construction site.

The safety program must include at least the following:

- .1 company safety and health policy;
- .2 description of the stages of the work;
- .3 total costs, schedule and projected workforce curves;
- .4 flow chart of safety and health responsibilities;

- .5 physical and material layout of the construction site;
- .6 risk assessment for each stage of the work, including preventive measures and the procedures for applying them;
- .7 identification of the preventive measures relative to the specific risks inherent to the worksite indicated in the article "RISKS INHERENT TO THE WORKSITE";
- .8 identification of preventive measures for health and safety of employees and / or public works site as indicated in the article "SPECIFIC REQUIREMENTS FOR THE HEALTH AND SAFETY OF OCCUPANTS AND PUBLIC";
- .9 training requirements;
- .10 procedures in case of accident/injury;
- .11 written commitment from all parties to comply with the safety program;
- .12 construction site inspection checklist based on the preventive measures;
- .13 emergency response plan which shall contain at least the following:
 - .1 construction site evacuation procedures;
 - .2 identification of resources (police, firefighters, ambulance services, etc.);
 - .3 identification of persons in charge of the construction site;
 - .4 identification of the first-aid attendants;
 - .5 communication organizational chart (including the person responsible for the site and the Departmental representative);
 - .6 training required for those responsible for applying the plan;
 - .7 any other information needed, in the light of the construction site's characteristics.

If available the Departmental representative will provide the evacuation procedures to the Contractor who shall then coordinate the construction site procedure with that of the site and submit it to the Departmental representative.

- .2 Departmental representative may respond in writing, where deficiencies or concerns are noted in the prevention program and may request resubmission with correction of deficiencies or concerns.
- .3 In addition to the prevention program, during the course of the work the Contractor shall elaborate and submit to the Departmental representative specific written procedures for any work having a high risk factor of accident (for example: demolition procedures, specific installation procedures, hoisting plan, procedures for entering a confined space, procedures for interrupting electric power, etc.) or at the request of the Departmental representative.
- .4 The Contractor shall plan and organize work so as to eliminate the danger at source or ensure collective protection, thereby minimizing the use of personal protective equipment.
- .5 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.
- .6 All mechanical equipment (for example, but not limited to: hoisting devices for persons or materials, excavators, concrete pumps, concrete saws) shall be inspected before

delivery to the construction site. Before using any mechanical equipment, the Contractor shall obtain a certificate of compliance signed by a qualified mechanic dated less than a week prior to the arrival of each piece of equipment on the construction site; the certificate shall remain on the construction site and transmitted to the Departmental representative on demand.

- .7 Ensure all inspections (daily, periodic, annual, etc.) for the hoisting devices for persons or materials required by the current standards are carried out and be able to provide a copy of the inspection certificates to the Departmental representative on demand.
- .8 The Departmental representative can at all times, if he suspects a malfunction or the risk of an accident, order the immediate stop of any piece of equipment and require an inspection by a specialist of his choice.
- .9 The Departmental representative must be consulted for the location of storing gas cylinders and tanks on the construction site.

1.12 RESPONSIBILITY

- .1 The Contractor must acknowledge and assume all the tasks and obligations which customarily devolve upon a principal Contractor under the terms of the *Loi sur la santé et la sécurité du travail* (L.R.Q., ch. S-2.1) (Act Respecting Occupational Health and Safety) and the *Code de sécurité pour les travaux de construction* (S-2.1, r.4) (Safety code for the construction industry).
- .2 The Contractor must be responsible for health and safety of persons on construction site, safety of property on construction site and for the protection of persons adjacent to construction site and the environment to the extent that they may be affected by conduct of the work.
- .3 No matter the size or location of the construction site, the Contractor must clearly define the limits of the construction site by physical means and respect all specific regulation requirements applicable in this regard. The means chosen to define the limits of the construction site must be submitted to the Departmental representative.

Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific prevention Plan.

1.13 COMPLIANCE REQUIREMENTS

- .1 Comply with the *Loi sur la santé et la sécurité du travail* (L.R.Q., c. S-2.1) (Act Respecting Occupational Health and Safety) and the *Code de sécurité pour les travaux de construction* (S-2.1, r. 4.) (Safety code for the construction industry) in addition to respecting all the requirements of this specification manual.

1.14 UNFORSEEN HAZARDS

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

1.15 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Departmental Representative.

1.16 CORRECTION OF NON-COMPLIANCE

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

1.17 WORK STOPPAGE

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

1.18 BLASTING

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

1.19 DIVING OPERATIONS

- .1 In accepting this contract, the Contractor agrees to satisfy the following requirements:
 1. Compliance with all the requirements of the *Règlement sur la santé et la sécurité du travail* (S-2.1, r.13) (Regulation respecting occupational health and safety), more precisely section XXVI. I, entitled *Travail effectué en plongée* (Underwater Work). Compliance, furthermore, with the latest editions of standards CAN/CSA Z275.2 – *Occupational Safety code for Diving Operations*, CAN/CSA Z275.1 – *Hyperbaric Chambers* and CAN/CSA Z275.4 – *Competency Standard for Diving Operations*. In the event of conflict between these requirements, the most stringent requirement shall apply.
 2. In addition to the above, in cases where construction work is involved, compliance with the *Code de sécurité pour les travaux de construction* (S-2.1, r.4) (Safety code for the Construction Industry).
 3. Before starting the work, submit to the Departmental representative the following documents, as per the *Règlement sur la santé et la sécurité au travail* (S-2.1, r.13) (Regulation respecting occupational health and safety):
 - a. the professional diving training certificate of each member of the dive team
OR a document recognizing the skills of those persons in accordance with the *Competency Standard for Diving Operations*, CAN/CSA Z275.4-02, as per section 312.8 of the Regulation;
 - b. the workplace first-aid training certificate of each member of the dive team;
 - c. the medical certificate of each member of the dive team;

- d. for each dive included in this contract, a dive plan containing the following information, in addition to that required under the *Règlement sur la santé et la sécurité au travail* (Regulation respecting occupational health and safety):
 - i. the thermal protection to be used;
 - ii. the repetitive dive factor;
 - iii. the no-decompression limit;
 - iv. the circumstances in which the dive must be terminated;
 - v. the procedures to be followed to ensure that machinery, equipment or devices that could create a hazard have been locked out;
 - vi. the decompression table to be used, as required;
 - e. notification confirming that a system for communicating with the *Service d'assistance médicale pour les urgences en plongée* (Medical assistance service for diving emergency) is available at the diving station at all times.
4. The Contractor shall take into account the following specific characteristics of the worksite, and adapt its dive plan accordingly:
5. Where the dive takes place at one of the following locations, provide the Departmental representative confirmation that the authorities concerned have been notified:
 - a. upstream or downstream from a hydraulic structure or submerged water line;
 - b. in marine waterways;
 - c. in port facilities.
6. If the dive station is more than 2 metres above the water, provide the Departmental representative:
 - a. a drawing of the equipment used to transport the worker through the air-water interface, if a device other than a stage is used for that purpose;
 - b. a drawing of the device used to hoist the stage or other device, unless that device is a crane or boom truck.
7. If the dive is carried out from a vessel, provide the Departmental representative the following documents:
 - a. proof of qualification of the vessel operator;
 - b. the vessel's certificate of compliance from Transport Canada.
8. Before starting the work, carry out an underwater rescue simulation at the site, as required under section 312.31 of the *Règlement sur la santé et la sécurité du travail* (S-2.1, r.13) (Regulation respecting occupational health and safety).
9. On a daily basis, complete and provide to the Departmental representative a checklist confirming the presence and condition of the equipment required at the dive site as per the dive plan.
10. Ensure that all other documents required under section XXVI of the *Règlement sur la santé et la sécurité du travail* (S-2.1, r.13) (Regulation respecting occupational health and safety) are available at the construction site at all times (diving logbook, diver's logbook, etc.).

1.20 FLOATING MATERIAL

- .1 Conform to the codes and to the municipal, provincial and national regulations concerning the present works
- .2 Mark out the floating equipment by navigation lights according to the Regulation on boarding and to the Notices to the sailors.
 - .1 Maintain a maritime radio set VHF (channel 16) aboard the floating equipment.
- .3 Obtain and submit to the Department Representative a letter of conformity emitted by Transport Canada for the approval of any boat (transport, rescue, inspection or other one) before the beginning of the works
- .4 Floating equipment and dredges installations have to be of sufficient capacity and in good working order, to allow the execution of works in a satisfactory way, according to the calendar and to the specification.
- .5 Organize activities so as to minimize the interference with the sailors and the fishermen using the harbor.
- .6 Maintain any time the access to the neighboring quays
- .7 Supply and place the necessary buoys of warning to indicate the zone of the works.
- .8 Inform the center of operations of the staff of quarter and the administrator of district of the Canadian Coastal Guard (CCG), Oceans and Fisheries Canada, the dredging works progress so that they can produce appropriate sailors notice.

1.21 WORKS NEAR BODIES OF WATER

- .1 For all the works involving risks of drowning, the following requirements must be met:
 - .1 Respect article 2.10.13 of the Safety code for building work.
 - .1 Wear a life jacket or a floating device allowing to maintain the head of the user outside the water and to be able to float effortlessly arms and in compliance with the following standard:
 - .1 CAN/CGSB-65.7-2007 – Life jackets
 - .2 Or for some exceptions, be accepted by Transport Canada.
 - .2 Or be protected by a safety net or a protective device against the falls.
 - .2 For every boat used (transport, rescue, inspection or other one), submit to the Departmental Representative, before the beginning of the works, a letter emitted by Transport Canada giving evidence that the boat is corresponding to the stipulations statutory of the Law on the merchant navy of Canada 2001. If there is more than a year between the date of delivery of this letter and the date of realization of the present works, submit also to the Departmental Representative a confirmation in the effect that the annual report of conformity required by Transport Canada was completed for the current year.

- .3 Ensure that a rescue vessel moored and in the water is available at each place where a worker may fall in the water. However, a vessel may serve more than one workplace on the same construction site provided the distance between any of these workplaces and the vessel is less than 100 m.
- .4 Make sure that the boat is equipped with an engine powerful enough to navigate in worksite conditions..
- .5 Make sure that the boat has required characteristics to take onboard the people there susceptible to take part in the rescue operation.
- .6 Make sure that the boat of rescue is available any time for the workers in case of emergency
- .7 Make sure that a qualified person is available to run the emergency equipment. This person has to hold its competence certificate according to the length of the boat.
- .8 Establish and transmit to the Department Representative the emergency procedures in which we find the information mentioned below and make sure that all the workers concerned by these procedures received the necessary training(formation) and the information to apply them :
 - .1 A description of completes procedures, including responsibilities of the people whom is allowed the access instead of work; ;
 - .2 The location of the emergency equipment.
- .9 Where the construction site is a wharf, a pier, a quay or any similar structure, a ladder with at least two (2) rungs below the surface of the water shall be installed on the front of the structure every 60 m. This measure applies even if it is a construction project. In this situation, if the owner does not possess the basic installations, a temporary (or portable) ladder can be used and taken off at the end of works. Contractor shall mention in writing to the owner that the site is not in compliance with the Canadian Code of the work, the part II.

1.22 LOCKOUT-TAGOUT

- .1 All lockout-tagout which will be made must be made according to the Occupational Health and safety act to the Safety code for the work of construction and the standard Z460 CSA
- .2 For any work on the equipment powered or susceptible to be started up in a accidental way, the Entrepreneur has to supply in writing and apply a procedure of lockout-tagout and fill the "Request form of cut to the source" supplied by the administrator of the building .
- .3 Although the following list is not exhaustive, here is some examples where the use of the form is mandatory:
 - .1 The main supply circuit of the building
 - .2 Electrical panel and sub panel
 - .3 The bus bars
 - .4 The centers of engines commands
 - .5 The emergency supply system
 - .6 The fire alarm and fire protection equipment

- .7 The equipment of mechanical protection (pump of catch basin, etc.)
- .8 The circuit of alarm for the services departments of buildings, in particular all the systems of heating, ventilation (breakdown) and air conditioning
- .9 Circuits feeding several equipment
- .10 The circuits concerning only one (1) part of the equipment used in a cooling system or of heating
- .4 The Contractor, after having completed form, shall have it signed by Department Representative before making any works.
- .5 In spite of the previous paragraphs, the Contractor will have to, in case of emergency, obtain an oral certificate of cut and, immediately after this one, record in writing the request of isolation or electric transfer.
- .6 The procedure asked to the paragraph 1 has to be in compliance with the principles expressed in the brochure " Lockout-Tagout " published by the equal Association in Health and Safety of the sector of the construction (ASP construction)
- .7 The staff of supervision and all the concerned workers must have taken the course " Lockout-Tagout " offered by ASP construction or the equivalent course given by another compagny.
- .8 For any work which must be made absolutely under energized equipment, identify these situations in writing and provide prevention measures which will be applied, including personal protective equipment.
- .9 For informational purpose, an example of Lockout-Tagout procedure is available on the News bulletin "Prévenir aussi", Volume 28, number 4, winter 2013-2014 of ASP construction. The Contractor has to present an adapted procedure, according to the works to be realized within the framework of the present mandate.

1.23 LIFTING MATERIAL

- .1 Lifting devices shall be positioned in such a way that loads are not carried over workers, occupants or the public.
- .2 The Contractor must transmit to department representative a work procedure, signed and sealed by an engineer, including inter alia the position of the crane, a sketch of the trajectory of the transported loads, the length of the mast and a plan of lifting for the handling of loads above occupied buildings. Department Representative can, if judge necessary, impose work of evening and weekend.
- .3 All mobile cranes manufactured after January 1st 1980 must be equipped with a safety device against overload.
- .4 All mobile cranes with cables manufactured after January 1st 1970, except if they are used for other end than lifting loads, must be provided with a safety device against two-blocking. Regarding mobile cranes with cables manufactured before January 1st 1970, they will have to be equipped with the device at the latest on December 31st 2006.
- .5 The Contractor shall provide the Department Representative with a mechanical service inspection certificate for each lifting device. Inspections must be carried out just prior to the delivery of the equipment to the work site.

- .6 For all winch installations, the Contractor shall provide the Department Representative with the installation method recommended by the manufacturer. If unavailable, the Contractor shall then provide an installation procedure signed and sealed by an engineer. The installation procedure must take into account load bearing capacity, the amount, weight and location of counterweight and any other detail that may affect the capacity and stability of the device.
- .7 In addition to the mechanical service inspection certificate, the annual inspection certificate and the crane logbook must be aboard all crane and crane-truck cabs.
- .8 The entire lifting area shall be closed off to prevent non-authorized people from entering it.
- .9 The Contractor shall obtain all of the permits at his own expense, in the event the thoroughfare must be temporarily closed off to meet the requirement stipulated in the preceding paragraph or for any other reason pertaining to the safety of workers, occupants or the public.
- .10 The Contractor shall carefully inspect all of the slings and lifting accessories and make sure that those in poor condition are destroyed or scrapped.
- .11 Compressed-gas cylinders shall be lifted with a basket specially designed for this purpose.

1.24 FALL PROTECTION

- .1 Contractor must ensure that any worker exposed to a fall hazard higher than 2.4 m wears a safety harness.
- .2 Plan and organize work so as to eliminate the risk of fall at the source or ensure collective protection, thereby minimizing the use of personal protective equipment. When personal fall protection is required, workers must use a safety harness that complies with CSA standard CAN/CSA Z-259.10 M90. A safety belt must not be used as fall protection.
- .3 Every person using an elevating platform (scissors, telescopic mast, articulated mast, rotative mast, etc.) must have a training regarding this equipment.
- .4 The use of a safety harness is mandatory for all elevating platforms with telescopic, articulate or rotative mast.
- .5 Define the limits of the danger zone around each elevating platform.

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 REQUIREMENTS

- .1 Division 01 – General requirements
- .2 Section 01 41 00 – Regulatory requirements
- .3 Section 01 74 21 – Construction-demolition waste management and disposal

1.2 REFERENCES

- .1 Definitions:
 - .1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.
 - .2 Environmental protection: prevention/control of pollution and, habitat and environmental disturbance during construction. The prevention of pollution and damage to environment covers the protection of the soil, water, air, biological and cultural resources; it also includes visual aesthetics, noise, solid, chemical, gas and liquid wastes, radiation energy, radioactive substances and other pollutants.
- .2 Reference Standards:
 - .1 Fisheries Act
 - .2 Canadian Environmental Protection Act, 1999 (1999)
 - .3 Navigation Protection Act LPN, L.R.C (1985), ch. N-22
 - .4 Politic of Soil Protection and Rehabilitation of Contaminated Sites (MSDEFCC) and Environmental analyses sampling guide relating to it.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit one (1) soft copy of required descriptive records, following the terms of WHMIS, in accordance with Section 01 35 29.06 - Health and Safety.
- .3 Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan to Departmental Representative.
- .4 Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.
- .5 Address topics at level of detail commensurate with environmental issue and required construction tasks.
- .6 Include in Environmental Protection Plan:

- .1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.
- .2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.
- .3 Names and qualifications of persons responsible for training site personnel.
- .4 Descriptions of environmental protection personnel training program.
- .5 Drawings indicating locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.
- .6 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather.
 - .1 Plans to include measures to minimize amount of material transported onto paved public roads by vehicles or runoff.
- .7 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.
 - .1 Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.
- .8 Spill Control Plan to include procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
- .9 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
- .10 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.
- .11 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
- .12 Waste Water Management Plan identifying methods and procedures for management discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.

1.4 FIRES

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

1.5 DRAINAGE

- .1 Develop and submit erosion and Sediment Control Plan (ESC) identifying type and location of erosion and sediment controls provided. Plan to include monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
- .2 Storm Water Pollution Prevention Plan (SWPPP) to be substituted for erosion and sediment control plan.

- .3 Provide temporary drainage and pumping required to keep excavations and site free from water.
- .4 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.
- .5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.6 WASTE MANAGEMENT AND DISPOSAL OF EXCAVATED SEDIMENTS

- .1 Refer to section 31 32 33.01 – Excavation, trenching and backfilling for permitted reuse of excavation material.
- .2 Manage various categories of contaminated material separately, without mixing them.
- .3 Sort materials for reuse/recycling or elimination
- .4 Remove excavated contaminated materials and store temporarily these materials on a watertight surface or on a tarpaulin or directly in sealed containers or trucks.
- .5 Cover contaminated material with water tight tarpaulin.
- .6 Carry out supervision of excavation works to detect the presence of contamination.
- .7 In case of doubt, Departmental Representative will carry out a soil analysis.
- .8 All waste material for removal become Contractor's property and remove waste materials from sea bed cleaning at daily regularly scheduled times.
- .9 Waste materials not reused, salvaged, or recycled must be arranged in one or several authorized sites by the Minister of Sustainable Development, Environment and the Fight against Climate Change (MSDEFCC)
- .10 Contractor shall keep the record of soil disposition and provide with a copy of results to Departmental Representative.
- .11 During the excavation of excess quarry run, in the ramp area and installation of armor rock stones, if an increase of suspended matter is noted, install a device to reduce the distribution of suspended matter
- .12 All material excavated in water must be drained and managed as soil according to applying regulation. The harnessing and the management of draining waters is the Contractor's responsibility. The latter is responsible for its method. This method will be subjected to the Ministry for approval and this one has to be in compliance with the current laws and regulations.

1.7 WORK ADJACENT TO WATERWAYS

- .1 Construction equipment to be operated on land only.
- .2 Use waterway beds for borrow material only after written receipt of approval from Departmental Representative.
- .3 Waterways to be kept free of excavated fill, waste material and debris.
- .4 Carry out vehicle maintenance and refuelling at a minimum distance of 30 meters from shore.
- .5 In case some of the equipment must be within 30 meters of water body, the Contractor shall submit a protection plan for the operations to the Departmental Representative.

- .6 Store fuel, or other hazardous substance, more than 30 meters away from water body. If temporary oil facilities are used, then storage facilities must be planned in accordance with applicable rules and regulations. Storage systems must be on impervious surfaces. A response kit in case of oil spills must be available on the site. Reduce as much as possible the use of engine brake.

1.8 TRANSPORTATION OF MATERIALS

- .1 Transportation of materials on public roads to the site shall be done from Monday to Saturday unless the competent authorities decide otherwise. Transportation shall not be allowed on Sundays and public holidays.
- .2 The Contractor shall ensure the proper functioning of the trucks used. Any truck or other means of transportation that the Departmental Representative considers too noisy shall not be used to transport materials unless it is repaired or improved upon to make it acceptable.
- .3 The Contractor shall use proper signs and cooperate with the municipality, the Departmental Representative and other competent authorities, so as to minimize the impact of transportation on the lives of residents around where the trucks pass and the project site.
- .4 Use tarpaulin to cover the materials during transportation.
- .5 Use watertight bins to transport wet materials such as dredged material.
- .6 Clean public roads every day, or at the request of the Departmental Representative, using a mechanic sweeper.

1.9 PRESERVING AQUATIC LIFE AT THE PROJECT SITE

- .1 Carry out if possible works in water between July 1st and August 15th and between October 10th and March 31st, during sensitive period for fish habitat.
- .2 Out of these periods, use an air bubble curtain or other device to reduce sub aquatic noises and suspended matter dispersion, to be submitted to Departmental Representative approbation. Air bubble curtain will be a suitable mitigation method to reduce suspended matter dispersion.
- .3 Between May 16th and June 19th, a monitoring for capelin presence will be carried out. If capelin presence is noted, work underwater will be interrupted during two (2) weeks, or until June 19th.
- .4 Sensitive period for marine mammals is between July 1st and September 30th. Use bubble curtain or other device to reduce sub aquatic noises during sheet piles installation, to be submitted to Departmental Representative approbation.
- .5 In presence of marine mammals inside 200m, work shall be interrupted until animals leave outside 200m distance.
- .6 If possible, perform work that produce underwater noises outside bird nesting period, which occur between May 1st and August 15th.
- .7 Do not get near bird colony and marine birds during reproduction and nesting period, stay 300m away from colony and avoid to disturb migratory birds during nesting period.
- .8 If possible, undertake noisy underwater works gradually.
- .9 If possible, sheet pile installation with vibratory hammer is preferred.
- .10 It is forbidden to dispose waste from demolition in water.
- .11 As the works progress, the Contractor shall thoroughly clean all water bodies around to

recover any debris from the work.

- .12 The Contractor shall minimize all work close to water bodies, be it along beaches or river banks. Works at low tide are preferred.
- .13 At no time should heavy machinery be taken into water bodies located outside the project site.
- .14 It is advisable to use equipment that minimizes mud suspension. Reducing the speed of the bucket as it drops and lifts during excavation will minimize the dispersion of the material in the water and it is important to educate the operators of excavation equipment on the issue.
- .15 Monitoring of suspended matter dispersion will be done. If required, mitigation measures shall be improved / modified.
- .16 Excavation in water should be done only in favourable weather conditions.
- .17 Place material near marine bottom, rather than pour or drop material.
- .18 Machinery and equipment used on and under water must use biodegradable vegetable oil.
- .19 Prevent dispersal of the dredged material, algae, mud, dust and water contained in the mud from the harbour and other water bodies.
- .20 The Contractor shall limit the work area in which the equipment and machinery will be kept at all times.
- .21 All granular materials used in this project must be clean and free from contamination.

1.10 POLLUTION CONTROL

- .1 Maintain temporary erosion and pollution control features installed under this Contract.
- .2 Control emissions from equipment and plant in accordance with local authorities' emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.
 - .1 Provide temporary enclosures where indicated or directed by Departmental Representative.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.
- .5 Machinery used will be maintained in good working condition, free of any contaminant and any adjustments will be made before it is brought on site. Ensure that there are no leakages of fuel, oil or grease. The Contractor must send a mechanical inspection certificate to the Departmental Representative on the condition of equipment just before their delivery to the site.
- .6 Avoid cleaning machines close to water.
- .7 Do not leave the engines of machines and trucks running unnecessarily.
- .8 An up-to-date environmental response kit must be in every machine, including even those for subcontractors.
- .9 In the case of an accidental spill of oil, fuel or other environmental incident, report the matter immediately to the Departmental Representative and the following authorities:
 - .1 Environment Canada, Environmental Emergencies Centre. Tél.: 866-283-2333.
 - .2 Ministry for Sustainable Development, Environment and the Fight against Climate Change (MDDELCC). Tél.: 1-866-694-5454.

- .3 Canadian Coast Guard, Maritime Pollution. Tél.: 800-363-4735.
- .4 Site Supervisor.

- .10 The Contractor shall make every effort to clog the source of the spills within the recommended security limits. Oil booms and/or oil absorbing mats will be used to contain spills. The mats or oil booms will be stored in a specific container at the shore and will be towed to absorb or contain spills. The mats and booms will be loaded inside sealed containers for treatment and/or appropriate disposal.
- .11 Soil contaminated by accidental spills should be stockpiled on waterproof tarpaulins and must be covered with waterproof tarpaulins, as well. Environmental quality checks should be done for such materials before they are taken away from the site, in accordance with the rules and regulations, and MDDELCC guidelines. They will then be taken to an authorized site.
- .12 Water contaminated by accidental spills will be kept and checked or immediately handed over to a specialized company, in accordance with the rules and regulations, and MDDELCC guidelines.
- .13 All relevant staff on the site will be fully trained on procedures for emergency response to spills, methods and use of equipment, as well as relevant materials.

1.11 SHEET PILE INSTALLATION

- .1 Carry out sheetpile installation on a 12 hours maximum period, during the day.
- .2 Use silt curtains if a trench for driving is required and for rock anchors installation.

1.12 CONSTRUCTION OF TREATED TIMBER CRIBWORK

- .1 Construction of treated timber cribwork have to be realized at a sufficient distance of a watercourse or other sensitive environment to avoid any contamination by the storing, the fragments or the sawdust.
- .2 Works have to be done in accordance with Best Management Practices for the use of treated wood in aquatic and wetland environments (WWP Institute, 2011).
- .3 Timbers shall be covered and stored on tarpaulin during transport and until implementation.
- .4 Fragments and sawdust will have to be got back and arranged according to the current regulations for this kind of material. If these materials are temporarily stored on site, they will have to find themselves between tarpaulin or in a tight container.

1.13 NONCOMPLIANCE NOTIFICATION

- .1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.
- .2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
 - .1 Take action only after receipt of written approval by Departmental Representative.
- .3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.

- .4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

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 Bury rubbish and waste materials on site where directed after receipt of written approval from Departmental Representative.
- .3 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.
- .4 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .5 Waste Management: separate waste materials for reuse/recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

Part 1 General

1.1 REFERENCES AND CODES

- .1 Meet or exceed requirements of:
 - .1 Contract documents.
 - .2 All the codes and CSA Standards applicable for the present project and all other standards specified in the present specification, such the applicable standards ASTM.

1.2 HAZARDOUS MATERIAL DISCOVERY

- .1 Asbestos: demolition of spray or trowel-applied asbestos is hazardous to health. Stop work immediately when material resembling spray or trowel-applied asbestos is encountered during demolition work. Notify Departmental Representative.
- .2 PCB: Polychlorinated Biphenyl: stop work immediately when material resembling Polychlorinated Biphenyl is encountered during demolition work. Notify Departmental Representative.

1.3 BUILDING SMOKING ENVIRONMENT

- .1 Comply with smoking restrictions and municipal by-laws.

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 REQUIREMENTS

- .1 Section 01 29 83 – Payment procedures for testing laboratory services
- .2 Section 03 20 00 – Concrete reinforcing
- .3 Section 03 30 00.01 – Cast-in-place concrete – short form
- .4 Section 03 41 00 – Precast structural concrete
- .5 Section 05 50 00 – Metal fabrication
- .6 Section 06 05 73 – Wood treatment
- .7 Section 06 10 00 – Rough carpentry
- .8 Section 35 31 25 – Placement of stone

1.2 REFERENCES

- .1 Not used.

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 special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, 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. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.

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 Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner 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 .

1.8 REPORTS

- .1 Submit four (4) copies of inspection and test reports to Departmental Representative.
- .2 Provide copies to subcontractor of work being inspected or tested or manufacturer or fabricator of material being inspected or tested.

1.9 TESTS AND MIX DESIGNS

- .1 Furnish test results and mix designs as requested.
- .2 Cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by Departmental Representative and may be authorized as recoverable unless they are asked by the Contractor and/or required by the Departmental Representative.

1.10 MOCK-UPS

- .1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of Sections required to provide mock-ups.
- .2 Construct in locations as specified in specific Section acceptable to Departmental Representative.
- .3 Prepare mock-ups for Departmental Representative review with reasonable promptness and in orderly sequence, to not cause delays in Work.
- .4 Failure to prepare mock-ups 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.
- .5 If requested, Departmental Representative will assist in preparing schedule fixing dates for preparation.
- .6 Remove mock-up at conclusion of Work or when acceptable to Departmental Representative.
- .7 Mock-ups may remain as part of Work.
- .8 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

1.11 MILL TESTS

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

1.12 EQUIPMENT AND SYSTEMS

- .1 Submit adjustment and balancing reports for mechanical, electrical [and building equipment] systems.

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 REQUIREMENTS

- .1 Section 01 52 00 – Construction facilities
- .2 Section 01 56 00 – Temporary barriers and enclosures
- .3 Section 01 74 11 – Cleaning
- .4 Section 01 74 21 – Construction-demolition waste management and disposal

1.2 REFERENCES

- .1 Electricity Canadian electrical code, last edition version

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

1.4 INSTALLATION AND REMOVAL

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

1.5 DEWATERING

- .1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

1.6 WATER SUPPLY

- .1 Provide continuous supply of potable water for construction use.
- .2 Arrange for connection with appropriate utility company and pay costs for installation, maintenance and removal.
- .3 Pay for utility charges at prevailing rates.
- .4 During connection of services, contractor shall provide with temporary supply to users at its own expenses.

1.7 TEMPORARY HEATING

- .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.
- .2 Construction heaters used on construction site or inside temporary facilities must be vented to outside or be non-flameless type. Solid fuel salamanders are not permitted.
- .3 Provide temporary heat and ventilation in enclosed areas as required to:
 - .1 Facilitate progress of Work.
 - .2 Protect Work and products against dampness and cold.
 - .3 Prevent moisture condensation on surfaces.

- .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
- .5 Provide adequate ventilation to meet health regulations for safe working environment.
- .4 Pay costs for maintaining temporary heat.
- .5 Maintain strict supervision of operation of temporary heating equipment to:
 - .1 Conform with applicable codes and standards.
 - .2 Enforce safe practices.
 - .3 Prevent abuse of services.
 - .4 Prevent damage to finishes.
 - .5 Vent direct-fired combustion units to outside.
- .6 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.8 TEMPORARY POWER AND LIGHT

- .1 Provide and pay for temporary power during construction for temporary lighting and operating of power tools. Also provide with temporary power supply to users.
- .2 Arrange for connection with appropriate utility company. Pay costs for installation, maintenance and removal.
- .3 Make electrical connections according to the Canadian Code of the electricity.
- .4 Temporary power for electric cranes and other equipment requiring in excess of above is responsibility of Departmental Representative.
- .5 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 100 lx.
- .6 Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of Departmental Representative provided that guarantees are not affected. Make good damage to electrical system caused by use under this Contract. Replace lamps which have been used for more than (3) months.

1.9 TEMPORARY COMMUNICATION FACILITIES

- .1 Provide and pay for temporary telephone, fax, data (web access) hook up, lines and equipment necessary for own use and use of Departmental Representative, he has to insure the connecting of these installations the main networks and assume the costs of all these service.

1.10 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 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 51 00 – Temporary utilities
- .2 Section 01 56 00 – Temporary barriers and enclosures
- .3 Section 01 74 11 – Cleaning
- .4 Section 01 74 21 – Construction-demolition waste management and disposal

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA-0121-M1978(R2003), Douglas Fir Plywood.
 - .3 CAN/CSA-S269.2-M1987(R2003), Access Scaffolding for Construction Purposes.
 - .4 CAN/CSA-Z321-96(R2001), Signs and Symbols for the Occupational Environment.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

1.4 INSTALLATION AND REMOVAL

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

1.5 SCAFFOLDING

- .1 Scaffolding in accordance with CAN/CSA-S269.2.
- .2 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms, and temporary stairs.

1.6 HOISTING

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

1.7 SITE STORAGE/LOADING

- .1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.
- .2 Do not load or permit to load any part of Work with weight or force that will endanger Work.

1.8 CONSTRUCTION PARKING

- .1 Parking will be permitted on site inside contractor zone.
- .2 Provide and maintain adequate access to project site.
- .3 Clean runways and taxi areas where used by Contractor's equipment.

1.9 SECURITY

- .1 If required, provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays.

1.10 OFFICES

- .1 Provide office heated to 22 degrees C, lighted 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table.
- .2 Provide marked and fully stocked first-aid case in a readily available location.
- .3 Subcontractors to provide their own offices as necessary. Direct location of these offices. The Contractor have to inform them, where they can install there temporary facilities.
- .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 2 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 Provide private washroom facilities adjacent to office complete with flush or chemical type toilet, lavatory and mirror, maintain cleanness and supply of paper towels and toilet tissue.
 - .7 Equip office with 1 x 2 m table, 3 chairs, including one with a pivoting backrest, 6 m of shelving 300 mm wide, one 3 drawer filing cabinet, one plan rack and one coat rack and shelf.
 - .8 Maintain in clean condition.

1.11 BOAT

- .1 Make sure that a boat is available for the Departmental Representative when required and that it is in good condition and safe.
- .2 Make sure that the boat is equipped with an engine enough strong to raise the current.
- .3 Make sure that the boat possesses the necessary characteristics to welcome there at least 4 people.
- .4 Make sure that a boat is available for the Departmental Representative anytime, when required during the works.
- .5 Make sure that a qualified person is available to run the boat. This person has to detain its card of skill of driver of boat according to the length of used boat.

1.12 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.

1.13 SANITARY FACILITIES

- .1 Provide sanitary facilities for work force and Departmental Representative 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.

1.14 CONSTRUCTION SIGNAGE

- .1 Provide and erect project sign, within three (3) weeks of signing Contract, in a location designated by Departmental Representative.
- .2 No other signs or advertisements, other than warning signs, are permitted on site.
- .3 Provide project identification site sign comprising foundation, framing, and one 1200 x 2400 mm signboard as detailed and as described below.
 - .1 Foundation: Solidly anchored or fixed.
 - .2 Framework and battens: SPF, pressure treated minimum 89 x 89 mm.
 - .3 Signboard: 19 mm 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 Vinyl sign face: printed project identification, self-adhesive, vinyl film overlay, supplied by Departmental Representative.
- .4 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.
- .5 Maintain approved signs and notices in good condition for duration of project, and dispose of on completion of project or earlier if directed by Departmental Representative.

1.15 PROTECTION AND MAINTENANCE OF TRAFFIC

- .1 Provide access and temporary relocated roads as necessary to maintain traffic.
- .2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.
- .3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs
- .4 Protect public users from damage to person and property.
- .5 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.
- .6 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.
- .7 Construct access and haul roads necessary.
- .8 Haul roads: constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided.
- .9 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
- .10 Dust control: adequate to ensure safe operation at all times.
- .11 During and after truck transport, clean roads regularly and at Departmental Representative demand.
- .12 Location, grade, width, and alignment of construction and hauling roads: subject to approval by Departmental Representative.
- .13 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.
- .14 Provide snow removal during period of Work.
- .15 Remove, upon completion of work, haul roads designated by Departmental Representative.

1.16 CLEAN-UP

- .1 Remove construction debris, waste materials, packaging material from work site daily.
- .2 Clean dirt or mud tracked onto paved or surfaced roadways.
- .3 Store materials resulting from demolition activities that are salvageable.

- .4 Stack stored new or salvaged material not in construction facilities.

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 REQUIREMENTS

- .1 Section 01 51 00 – Temporary utilities
- .2 Section 01 52 00 – Construction facilities
- .3 Section 01 56 00 – Temporary barriers and enclosures
- .4 Section 01 74 11 – Cleaning
- .5 Section 01 74 21 – Construction-demolition waste management and disposal

1.2 INSTALLATION AND REMOVAL

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

1.3 SITE FENCE

- .1 Raise a temporary tough, resistant and well attached security fence of 1.83m high (6') around the site and all works and storage areas.
- .2 For each of the fenced areas, provide a pedestrian access route that can be locked. Provide locks/padlocks and keys for access routes. Give three (3) copies of each key to the Departmental Representative.
- .3 Fences actually installed on wharf can be recovered to fence work zones. Those fences are provided with base plates and are anchored to concrete slab.

1.4 GUARD RAILS AND BARRICADES

- .1 Provide secure, rigid guard rails and barricades around deep excavations or others.
- .2 Provide as required by governing authorities.

1.5 ACCESS TO SITE

- .1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work, ensure maintenance and dismantling at the end of the project.

1.6 PUBLIC TRAFFIC FLOW

- .1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect public.

1.7 FIRE ROUTES

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

1.8 PROTECTION OF SURROUNDING PUBLIC AND PRIVATE PROPERTIES

- .1 Before work begins, carry out a joint inspection with the Departmental Representative and the Contractor to identify and list all existing damage to public and private properties. Take photographs to serve as records.
- .2 Protect surrounding public and private properties against any damage that could occur as a result of works.
- .3 Pay particular attention to the protection of finished surfaces of buildings close to the project site. Provide screens, tarpaulins and barriers needed for protection.
- .4 Pay particular attention to the protection of the asphalt covering of access routes and parking lots.
- .5 If necessary, take full responsibility for damages.
- .6 Identify public services, protect them and take responsibility for damages due to the lack of protection or inadequate protection.
- .7 Take full responsibility for damages to the structures due to the lack of protection or inadequate protection.

1.9 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse/recycling or elimination 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 REFERENCES

- .1 Within text of each specifications section, reference may be made to reference standards.
- .2 Conform to these reference standards, in whole or in part as specifically requested in specifications.
- .3 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.
- .4 Cost for such testing will be borne by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

1.2 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 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.
- .3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .4 Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.
- .5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .6 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.

1.3 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 may be delayed for such reason, Departmental

Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.4 STORAGE, HANDLING AND PROTECTION

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

1.5 TRANSPORTATION

- .1 Pay costs of transport, handling and storing of products required in performance of Work.
- .2 Insure the cost of handling and the storing of products listed in appendix 2 and 3. The costs of transport and unloading will be assumed by Departmental Representative

1.6 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.

1.7 QUALITY OF WORK

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify

Departmental Representative if required Work is such as to make it impractical to produce required results.

- .2 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.

1.8 CO-ORDINATION

- .1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 Be responsible for coordination of the work and placement of components

1.9 CONCEALMENT

- .1 In finished areas conceal pipes, ducts and wiring, except where indicated otherwise.
- .2 Before installation inform Departmental Representative if there is interference. Install as directed by Departmental Representative.

1.10 REMEDIAL WORK

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

1.11 FASTENINGS

- .1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.
- .2 Prevent electrolytic action between dissimilar metals and materials.
- .3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.
- .4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.
- .5 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.12 FASTENINGS - EQUIPMENT

- .1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service, except where indicated otherwise
- .2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use hot-dip galvanised steel for exterior areas.
- .3 Bolts may not project more than one diameter beyond nuts.

1.13 PROTECTION OF WORK IN PROGRESS

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

Approved: 2006-06-30

Part 1 General

1.1 REFERENCE STANDARDS

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

1.2 QUALIFICATIONS OF SURVEYOR

- .1 Qualified registered land surveyor, licensed to practise in Place of Work, acceptable to Departmental Representative.

1.3 SURVEY REFERENCE POINTS

- .1 Existing base horizontal and vertical control points are designated on drawings.
- .2 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.
- .3 Make no changes or relocations without prior written notice to Departmental Representative.
- .4 Report Departmental Representative when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- .5 Require surveyor to replace control points in accordance with original survey control.

1.4 SURVEY REQUIREMENTS

- .1 Establish two permanent bench marks on site, referenced to established bench marks 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 Stake for grading and fill.
- .4 Stake slopes.
- .5 Establish pipe invert elevations.
- .6 Stake batter boards for foundations .
- .7 Establish lines and levels for mechanical and electrical work.

1.5 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 .

1.6 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.

1.7 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit name and address of Surveyor to Departmental Representative .
- .2 On request of Departmental Representative, submit documentation to verify accuracy of ground investigation and field engineering work.
- .3 Submit certificate signed by surveyor certifying those elevations and locations of completed Work that conform with Contract Documents.

1.8 SUBSURFACE CONDITIONS

- .1 Promptly notify Consultant 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 Consultant 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 RELATED REQUIREMENTS

- .1 Section 01 74 21 – Construction-demolition waste management and disposal
- .2 Section 02 41 16.01 – Structure demolition – short form

1.2 REFERENCES

- .1 Not used.

1.3 PROJECT CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by subcontractors.
- .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, unless approved by Departmental Representative.
- .3 Clear snow and ice from access to construction site, bank/pile snow in designated areas only and remove from site if required.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide on-site containers for collection of waste materials and debris.
- .6 Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .7 Eliminate waste materials outside of the construction site according to the regulations.
- .8 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 subcontractors.
- .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, unless approved by Departmental Representative.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

- .7 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .8 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .9 Remove dirt and other disfiguration from exterior surfaces.
- .10 Remove snow and ice from access to building.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse/recycling or elimination 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 WASTE MANAGEMENT GOALS

- .1 Minimize amount of non-hazardous solid waste generated by project and accomplish maximum source reduction, reuse and recycling of solid waste.
- .2 Protect environment and prevent environmental pollution damage.

1.2 RELATED REQUIREMENTS

- .1 Section 01 74 11 – Cleaning
- .2 Section 02 41 16.01 – Structure demolition – short form
- .3 Section 35 20 23 – Dredging

1.3 REFERENCES

- .1 Definitions:
 - .1 **Construction, Renovation and/or Demolition (CRD) Waste:** Class III solid, non-hazardous waste materials generated during construction, demolition, and/or renovation activities
 - .2 **Inert Fill:** inert waste - exclusively asphalt and concrete.
 - .3 **Separate Condition:** refers to waste sorted into individual types.
 - .4 **Approved/Authorized recycling facility:** waste recycler approved by applicable provincial authority or other users of material for recycling approved by the Departmental Representative.
 - .5 **Class III non-hazardous waste** - construction renovation and demolition waste.
 - .6 **Salvage:** removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
 - .7 **Recyclable:** ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
 - .8 **Recycling:** process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
 - .9 **Recycle:** process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
 - .10 **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.
 - .11 **Source Separation:** act of keeping different types of waste materials separate beginning from the point they became waste.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

1.5 USE OF SITE AND FACILITIES

- .1 Execute Work with minimal interference and disturbance to normal use of premises.
- .2 Maintain security measures established by facility provide temporary security measures approved by Departmental Representative.
- .3 Provide, on the construction site, enough container to collect, handle and store the anticipated quantities of reusable and recyclable scrap materials.
- .4 On-the-spot sale of collected scrap materials is not allowed, except with written authorization of the Departmental Representative.

1.6 WASTE PROCESSING SITES

- .1 Contractor is responsible to research and locate waste diversion resources and service providers. Salvaged materials are to be transported off site to approved and/or authorized recycling facilities or to users of material for recycling.
- .2 Provide the documents which confirm arrangement of the waste in authorized sites.

1.7 STORAGE, HANDLING AND PROTECTION

- .1 Unless specified otherwise, materials for removal become Contractor's property.
- .2 Protect, stockpile, store and catalogue salvaged items.
- .3 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
- .4 Protect structural components not removed and salvaged materials from movement or damage.
- .5 Support affected structures. If safety of structure is endangered, cease operations and immediately notify Departmental Representative.
- .6 Provide on-site facilities and containers for collection and storage of reusable and recyclable materials.
- .7 Separate and store materials produced during project in designated areas.
- .8 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated processing facilities.
 - .1 On-site source separation is recommended.
 - .2 Remove co-mingled materials to off site processing facility for separation.
 - .3 Obtain waybills, receipts and/or scale tickets for separated materials removed from site.
 - .4 Materials reused on-site are considered to be diverted from landfill and as such are to be included in all reporting.

1.8 DISPOSAL OF WASTES

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of wastes into waterways, storm, or sanitary sewers.
- .3 Remove materials on-site as Work progresses.

1.9 ARRANGEMENT OF SOILS AND DREDGED SEDIMENTS

- .1 Refer to the section 35 20 23 – Dredging

1.10 SCHEDULING

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

Part 2 Execution

2.1 GENERAL

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

2.2 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.

2.3 CANADIAN GOVERNMENTAL DEPARTMENTS CHIEF RESPONSIBILITY FOR THE ENVIRONMENT

- .1 Government Chief Responsibility for the Environment:

Minister of Sustainable Development, Environment and the Fight against Climate Change			
Québec	Informations center Édifice Marie-Guyart, 29e étage 675, boulevard René-Lévesque Est Québec, Québec G1R 5V7	418 521-3830 1-800-561-1616	418-646-5974
Sainte-Anne-des-Monts	124, 1 ^{re} Avenue Ouest Sainte-Anne-des-Monts, Québec G4V 1C5	418 763-3301	418 763-7810
Rimouski	212, avenue Belzile Rimouski, Québec G5L 3C3	418 727-3511	418 727-3849

CARLETON SUR MER
Reconstruction of wharf
Project: 721198

Section 01 74 21
CONSTRUCTION/DEMOLITION WASTE
MANAGEMENT AND DISPOSAL
Page 4 of 4

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 74 11 – Cleaning

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Acceptance of Work Procedures:
 - .1 Contractor's Inspection: Contractor: conduct 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 submit verification that corrections have been made.
 - .2 Request Departmental Representative inspection.
 - .2 Departmental Representative Inspection:
 - .1 Departmental Representative and Contractor to inspect Work and identify defects and deficiencies.
 - .2 Contractor to correct Work as directed.
 - .3 Completion Tasks: submit written certificates in French that tasks have been performed as follows:
 - .1 Work: completed and inspected for compliance with Contract Documents.
 - .2 Defects: corrected and deficiencies completed.
 - .3 Equipment and systems: tested, adjusted, balanced and fully operational.
 - .4 Operation of systems: demonstrated to Owner's personnel.
 - .5 Work: complete and ready for final inspection.
 - .4 Final Inspection:
 - .1 When completion tasks are done, request final inspection of Work by Departmental Representative, and Contractor.
 - .2 When Work incomplete according to Owner and Departmental Representative, complete outstanding items and request re-inspection.
 - .5 Declaration of Substantial Performance: when Departmental Representative considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.
 - .6 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.
 - .7 Final Payment:

- .1 When Departmental Representative considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.
- .2 When Work deemed incomplete by Departmental Representative, complete outstanding items and request re-inspection.

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, recycling, or elimination 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 REQUIREMENTS

- .1 Section 01 77 00 – Closeout procedures

1.2 REFERENCES

- .1 Not used.

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Warranty Meeting prior to Closeout :
 - .1 Convene meeting one (1) week prior to contract completion with Contractor's representative and Departmental Representative, in accordance with Section 01 31 19 - Project Meetings to:
 - .1 Verify Project requirements.
 - .2 Review warranty requirements.
 - .2 Departmental Representative to establish communication procedures for:
 - .1 Notifying construction warranty defects.
 - .2 Determine priorities for type of defects.
 - .3 Determine reasonable response time.
 - .3 Contact information for bonded and licensed company for warranty work action: provide name, telephone number and address of company authorized for construction warranty work action.
 - .4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Two (2) weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, four (4) final copies of operating and maintenance manuals in English and French.
- .3 Two (2) weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, one (1) final electronic version (pdf) of operating and maintenance manuals in English and French.
- .4 Provide spare parts, maintenance materials and special tools of same quality and manufacture as products provided in Work.
- .5 Provide evidence, if requested, for type, source and quality of products supplied.

1.5 FORMAT

- .1 Organize data as instructional manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.

- .3 When multiple binders are used correlate data into related consistent groupings.
 - .1 Identify contents of each binder on spine.
- .4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5 Arrange content by process flow, under Section numbers and sequence of Table of Contents.
- .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .7 Text: manufacturer's printed data, or typewritten data.
- .8 Drawings: provide with reinforced punched binder tab.
 - .1 Bind in with text; fold larger drawings to size of text pages.
- .9 Provide 1:1 scaled CAD files in dwg format on CD.

1.6 CONTENTS - PROJECT RECORD DOCUMENTS

- .1 Table of Contents for Each Volume: provide title of project;
 - .1 Date of submission; names.
 - .2 Addresses, and telephone numbers of Ministry and Contractor with name of responsible parties.
 - .3 Schedule of products and systems, indexed to content of volume.
- .2 For each product or system:
 - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Typewritten Text: as required to supplement product data.
 - .1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

1.7 AS -BUILT DOCUMENTS 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.
 - .1 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.
 - .1 Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition.
 - .1 Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Departmental Representative.

1.8 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

- .1 Record information on set of red line opaque drawings, and in copy of Project Manual, provided by Departmental Representative.
- .2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress.
 - .1 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 underground utilities and appurtenances, referenced to permanent surface improvements.
 - .2 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .3 Field changes of dimension and detail.
 - .4 Changes made by change orders.
 - .5 Details not on original Contract Drawings.
 - .6 References to related shop drawings and modifications.
- .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.
- .7 Provide digital photos, if requested, for site records.

1.9 EQUIPMENT AND SYSTEMS

- .1 For each item of equipment and each system include description of unit or system, and component parts.
 - .1 Give function, normal operation characteristics and limiting conditions.
 - .2 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.
 - .1 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 Provide servicing and lubrication schedule, and list of lubricants required.
- .7 Include manufacturer's printed operation and maintenance instructions.
- .8 Include sequence of operation by controls manufacturer.
- .9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- .10 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- .11 Additional requirements: as specified in individual specification sections.

1.10 WARRANTIES AND BONDS

- .1 Develop warranty management plan to contain information relevant to Warranties.
- .2 Submit warranty management plan, (30) days before planned pre-warranty conference, to Departmental Representative approval.
- .3 Warranty management plan to include required actions and documents to assure that Departmental Representative receives warranties to which it is entitled.
- .4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.
- .5 Submit, warranty information made available during construction phase, to Departmental Representative for approval prior to each monthly pay estimate.
- .6 Assemble approved information in binder, submit upon acceptance of work and organize binder as follows:
 - .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
 - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

- .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten (10) days after completion of applicable item of work.
- .4 Verify that documents are in proper form, contain full information, and are notarized.
- .5 Co-execute submittals when required.
- .6 Retain warranties and bonds until time specified for submittal.
- .7 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.
- .8 Conduct joint (9) month warranty inspection, measured from time of acceptance, by Departmental Representative.
- .9 Include information contained in warranty management plan as follows:
 - .1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.
 - .2 Listing and status of delivery of Certificates of Warranty for extended warranty items, to include transformers and commissioned systems.
 - .3 Provide list for each warranted equipment, item, feature of construction or system indicating:
 - .1 Name of item.
 - .2 Model and serial numbers.
 - .3 Location where installed.
 - .4 Name and phone numbers of manufacturers or suppliers.
 - .5 Names, addresses and telephone numbers of sources of spare parts.
 - .6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.
 - .7 Cross-reference to warranty certificates as applicable.
 - .8 Starting point and duration of warranty period.
 - .9 Summary of maintenance procedures required to continue warranty in force.
 - .10 Cross-Reference to specific pertinent Operation and Maintenance manuals.
 - .11 Organization, names and phone numbers of persons to call for warranty service.
 - .12 Typical response time and repair time expected for various warranted equipment.
 - .4 Contractor's plans for attendance at (9) month post-construction warranty inspections.
 - .5 Procedure and status of tagging of equipment covered by extended warranties.
 - .6 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

- .10 Respond in timely manner to oral or written notification of required construction warranty repair work.
- .11 Written verification to follow oral instructions.
 - .1 Failure to respond will be cause for the Departmental Representative to proceed with action against Contractor.

1.11 WARRANTY TAGS

- .1 Tag, at time of installation, each warranted item. Provide durable, oil and water resistant tag approved by Departmental Representative.
- .2 Attach tags with copper wire and spray with waterproof silicone coating.
- .3 Leave date of acceptance until project is accepted for occupancy.
- .4 Indicate following information on tag:
 - .1 Type of product/material
 - .2 Model number
 - .3 Serial number
 - .4 Contract number
 - .5 Warranty period
 - .6 Inspector's signature
 - .7 Construction Contractor

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 REQUIREMENTS

- .1 Section 01 35 43 – Environmental procedures
- .2 Section 01 74 11 – Cleaning
- .3 Section 01 74 21 – Construction-demolition waste management and disposal

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA S350-M1980 (R2003), Code of Practice for Safety in Demolition of Structures.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Before proceeding with demolition of load bearing walls and other walls and where required by authority having jurisdiction submit for review by Departmental Representative shoring and underpinning drawings prepared by qualified professional engineer registered or licensed in the Province of Quebec in Canada showing proposed method.

1.4 DELIVERY, STORAGE AND HANDLING

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

1.5 SITE CONDITIONS

- .1 Review designated substance report and take precautions to protect environment.
- .2 If a material listed as dangerous is discovered during the execution of the works, stop and take the appropriate precautions and to inform immediately the Departmental Representative.
 - .1 Do not proceed until written instructions have been received from Departmental Representative.
- .3 Notify Departmental Representative and obtain its agreement before disrupting the access to the work or interrupting the services.

Part 2 Products

2.1 EQUIPMENT AND MATERIAL

- .1 Leave equipment and machinery running only while in use, except where extreme temperatures prohibit shutting down.

- .2 Demonstrate that tools and machinery are being used in manner which allows for salvage of materials in best condition possible.

Part 3 Execution

3.1 PREPARATION

- .1 Do Work in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .2 Protection:
 - .1 Prevent movement, settlement, or damage to adjacent structures, utilities and parts of building to remain in place. Provide bracing and shoring required.
 - .2 Keep noise, dust, and inconvenience to occupants to minimum.
 - .3 Protect building systems, services and equipment.
 - .4 Provide temporary dust screens, covers, railings, supports and other protection as required.
- .3 Disconnect and re-route electrical, telephone and communication service lines. Post warning signs on electrical lines and equipment which must remain energized to serve other products during period of demolition.
- .4 Locate and protect utility lines. Do not disrupt active or energized utilities designated to remain undisturbed.

3.2 DEMOLITION SALVAGE AND DISPOSAL

- .1 Dismantle or support temporarily the parts of the existing work the removal of which is necessary to permit new construction.
- .2 Execute saw cut at demolition limit.
- .3 Refer to demolition drawings and specifications for items to be salvaged for reuse.
- .4 Remove items to be reused, store as directed by Departmental Representative, and re-install under appropriate section of specification.
- .5 Dispose of removed materials, to appropriate recycling or reuse facilities except where specified otherwise, in accordance with authority having jurisdiction.

3.3 PARTIAL DEMOLITION OF STRUCTURES

- .1 Refer to the prescriptions and demolition's drawings to identify the elements of the work to be partially or completely demolished and which are the elements to kept

3.4 DISMANTLEMENT

- .1 Refer to the prescriptions and drawings to identify the elements of the work to be dismantled with the aim of their reinstallation or of their return to the ministry.

3.5 STOCKPILING

- .1 Label stockpiles, indicating material type and quantity.
- .2 Designate appropriate security resources/measures to prevent vandalism, damage and theft.

- .3 Locate stockpiled materials convenient for use in new construction. Eliminate double handling wherever possible.
- .4 Stockpile materials designated for alternate disposal in location which facilitates removal from site and examination by potential end markets, and which does not impede disassembly, processing, or hauling procedures.

3.6 REMOVAL FROM SITE

- .1 Transport material designated for alternate disposal to approved facilities receiving organizations and in accordance with applicable regulations. Do not deviate from facilities or receiving organizations without prior written authorization from Departmental Representative.
- .2 Dispose of materials not designated for alternate disposal in accordance with applicable regulations in disposal facilities approved. Do not deviate from disposal facilities without prior written authorization from Departmental Representative.

3.7 CLEANING AND RESTORATION

- .1 Keep site clean and organized throughout demolition procedure.
- .2 Upon completion of project, reinstate areas, parking surfaces, walkways, light standards, affected by Work to condition which existed prior to beginning of Work or match condition of adjacent, undisturbed areas.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 03 20 00 – Concrete reinforcing
- .2 Section 03 30 00.01 – Cast-in-place concrete – short form
- .3 Section 03 37 26 – Underwater placed concrete
- .4 Section 03 41 00 – Precast structural concrete

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1-04/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA-O86S1-05, Supplement No. 1 to CAN/CSA-O86-01, Engineering Design in Wood.
 - .3 CSA O121-M1978 (R2013), Douglas Fir Plywood.
 - .4 CSA O151-04, Canadian Softwood Plywood.
 - .5 CSA O153-M1980 (R2008), Poplar Plywood.
 - .6 CSA O437 Series-93 (R2006), Standards for OSB and Waferboard.
 - .7 CSA S269.1-1975 (R2003), Falsework for Construction Purposes.
 - .8 CAN/CSA-S269.3-M92 (R2013), Concrete Formwork, National Standard of Canada

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit shop drawings for formwork and falsework.
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.
- .3 Submit - Material Safety Data Sheets in accordance with WHMIS MSDS.
- .4 Co-ordinate submittal requirements and provide submittals required by this section.
- .5 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. Comply with CSA S269.1, for falsework drawings and Comply with CAN/CSA-S269.3 for formwork drawings.
- .6 Indicate formwork design data: permissible rate of concrete placement, and temperature of concrete, in forms.
- .7 Indicate sequence of erection and removal of formwork/falsework as directed by Departmental Representative.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Waste Management and Disposal:
 - .1 Separate waste materials and unused materials for reuse, recycling or elimination in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .2 Place materials defined as hazardous or toxic in designated containers.

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, CSA O437 Series and CSA-O153.
 - .2 Rigid insulation board: to CAN/ULC-S701.
- .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 diameter in concrete surface.
 - .2 For Architectural concrete, use snap ties complete with plastic cones and light grey concrete plugs.
- .3 Form release agent: non-toxic, biodegradable, low VOC.
- .4 Form stripping agent: colourless mineral oil, non-toxic, biodegradable, low VOC, free of kerosene, with viscosity between 70 and 110s Saybolt Universal 15 to 24 mm²/s at 40 degrees C, flashpoint minimum 150 degrees C, open cup.
- .5 Falsework materials: to CSA-S269.1.

Part 3 Execution

3.1 FABRICATION AND ERECTION

- .1 Verify lines, levels and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.
- .2 Obtain Departmental Representative's approval for use of earth forms framing openings not indicated on drawings.
- .3 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.
- .4 Fabricate and erect falsework in accordance with CSA S269.1.
- .5 Do not place shores and mud sills on frozen ground.
- .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 25 mm fillets at interior corners, joints, unless specified otherwise.
- .9 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.
- .10 Construct forms for architectural concrete, and place ties as indicated
 - .1 Joint pattern not necessarily based on using standard size panels or maximum permissible spacing of ties.
- .11 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections.
 - .1 Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.
- .12 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.
- .13 Align form joints and make watertight.
- .14 Keep form joints to minimum.

3.2 REMOVAL AND STRAINING

- .1 Leave formwork in place for a minimum of 48 hours after placing concrete, for all concrete elements
- .2 Re-use formwork and falsework subject to requirements of CSA-A23.1/A23.2.
- .3 For precast concrete slab, the Contractor will have to demonstrate that the slab reached a sufficient resistance before circulating on this one, after their installation.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 03 10 00 – Concrete forming and accessories
- .2 Section 03 20 00 – Concrete reinforcing
- .3 Section 03 37 26 – Underwater placed concrete
- .4 Section 03 41 00 – Precast structural concrete

1.2 PRICE AND PAYMENT PROCEDURES

- .1 Measurement and Payment
 - .1 No measurement will be made under this Section.
 - .1 Include reinforcement costs in items of concrete work in following sections:
 - 03 30 00.01 - Cast-In-Place Concrete short form.
 - 03 37 26 – Underwater placed concrete
 - 03 41 00 – Precast structural concrete

1.3 REFERENCES

- .1 American Concrete Institute (ACI)
 - .1 SP-66-04, ACI Detailing Manual 2004.
- .2 ASTM International
 - .1 ASTM A82/A82M-07, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
 - .2 ASTM A-123, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 - .3 ASTM A143/A143M-07, Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
 - .4 ASTM A185/A185M-07, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
- .3 CSA International
 - .1 CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .2 CAN/CSA-A23.3-04 (R2010), Design of Concrete Structures.
 - .3 CSA-G30.18-09, Carbon Steel Bars for Concrete Reinforcement.
 - .4 CSA-G40.20/G40.21-04 (R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .5 CSA W186-M1990 (R2007), Welding of Reinforcing Bars in Reinforced Concrete Construction.

- .4 Reinforcing Steel Institute of Canada (RSIC)
 - .1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.

1.4 ACTION/INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice
- .3 Shop Drawings
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Quebec of Canada.
 - .1 Indicate placing of reinforcement and:
 - .1 Bar bending details.
 - .2 Lists.
 - .3 Quantities of reinforcement.
 - .4 Sizes, spacings, 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, spacings and locations of chairs, spacers and hangers. Use steel or plastic chair, concrete block is not allowed.
 - .2 Detail lap lengths and bar development lengths to CAN/CSA-A23.3.

1.5 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 four (4) weeks prior to beginning reinforcing work.
 - .2 Upon request submit in writing to Departmental Representative proposed source of reinforcement material to be supplied.

1.6 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, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.
- .4 All the reinforcing steel will be delivered free of rust except for that which may have been formed during transport to the site. It will be protected at all times against moisture, grease, dirt, mortar or cement until it is finally used.

Part 2 Products

2.1 MATERIALS

- .1 Substitute different size bars only if permitted in writing by Departmental Representative.
- .2 Reinforcing steel: billet steel, grade 400W, deformed bars to CSA-G30.18, unless indicated otherwise.
- .3 Cold-drawn annealed steel wire ties: to ASTM A82/A82M.
- .4 Deformed steel wire for concrete reinforcement: to ASTM A82/A82M.
- .5 Welded steel wire fabric: to ASTM A185/A185M.
 - .1 Provide in flat sheets only.
- .6 Galvanizing of non-prestressed reinforcement: to CAN/CSA-G164, minimum zinc coating 610 g/m².
 - .1 Protect galvanized reinforcing steel with chromate treatment to prevent reaction with Portland cement paste.
 - .2 If chromate treatment is carried out immediately after galvanizing, soak steel in aqueous solution containing minimum 0.2% by weight sodium dichromate or 0.2% chromic acid.
 - .1 Temperature of solution equal to or greater than 32 degrees and galvanized steels immersed for minimum 20 seconds.
 - .3 If galvanized steels are at ambient temperature, add sulphuric acid as bonding agent at concentration of 0.5% to 1%.
 - .1 In this case, no restriction applies to temperature of solution.
 - .4 Chromate solution sold for this purpose may replace solution described above, provided it is of equivalent effectiveness.
 - .1 Provide product description as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.
- .7 Chairs, bolsters, bar supports, spacers: to CSA-A23.1/A23.2.
- .8 Plain round bars: to CSA-G40.20/G40.21.

2.2 FABRICATION

- .1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2, Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.
- .2 Obtain Departmental Representative's written 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.

2.3 SOURCE QUALITY CONTROL

- .1 Upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum four (4) weeks prior to beginning reinforcing work.
- .2 Upon request inform Departmental Representative of proposed source of material to be supplied.

Part 3 Execution

3.1 PREPARATION

- .1 Galvanizing to include chromate treatment.
 - .1 Duration of treatment to be 1 hour per 25 mm of bar diameter.
- .2 Conduct bending tests to verify galvanized bar fragility in accordance with ASTM A143/A143M.

3.2 FIELD BENDING

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

3.3 PLACING REINFORCEMENT

- .1 Place reinforcing steel as indicated on placing drawings 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 Prior to placing concrete, obtain Departmental Representative's approval of reinforcing material and placement.
- .4 Ensure cover to reinforcement is maintained during concrete pour.
- .5 Welds points on reinforcing bars are prohibited

3.4 FIELD TOUCH-UP

- .1 Touch up damaged and cut ends of epoxy coated or galvanized reinforcing steel with compatible finish to provide continuous coating.

3.5 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, recycling or elimination in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 03 10 00 – Concrete forming and accessories
- .2 Section 03 20 00 – Concrete reinforcing
- .3 Section 03 37 26 – Underwater placed concrete
- .4 Section 03 41 00 – Precast structural concrete

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM A185/A185M-07, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
 - .2 ASTM D260-86(2001), Standard Specification for Boiled Linseed Oil.
 - .3 ASTM D1751-04, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non extruding and Resilient Bituminous Types).
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-19.24-M90, Multicomponent, Chemical-Curing Sealing Compound.
- .3 CSA International
 - .1 CSA-A23.1/A23.2-2014, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA A3000-13, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
 - .3 CAN/CSA-G30.18-R2009, Billet-Steel Bars for Concrete Reinforcement.

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-installation Meetings: in accordance with Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart, convene pre-installation meeting one (1) week prior to beginning concrete works.
 - .1 Ensure Departmental Representative testing laboratories attend.
 - .2 Verify project requirements.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
 - .1 Submit placing drawings prepared in accordance with plans to clearly show size, shape, location and necessary details of reinforcing.
 - .2 Submit drawings showing formwork and falsework design to: CSA A23.1/A23.2.

- .3 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.
- .3 At least four (4) weeks prior to beginning Work, inform Departmental Representative of source of fly ash.
 - .1 Do not change source of fly ash without written approval of Departmental Representative.
- .4 At least four (4) weeks prior to beginning Work, submit to Departmental Representative samples of following materials proposed for use: curing compound, joint filler, waterstops.
- .5 At least four (4) weeks prior to beginning Work, submit to Departmental Representative data sheets of following materials to be used in concrete mix:
 - .1 Supplementary cementing materials
 - .2 Blended hydraulic cement
 - .3 Admixture
 - .4 Fine and coarse aggregate
 - .5 Fly ash
- .6 Provide concrete mix formula results and reports for review by Departmental Representative and do not proceed without written approval when deviations from mix design or parameters are found.
- .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.

1.5 QUALITY ASSURANCE

- .1 Provide to Departmental Representative, four 4 weeks minimum prior to starting concrete work, valid and recognized certificate from plant delivering concrete.
 - .1 Quality Control Plan: provide written report to Departmental Representative verifying compliance that concrete in place meets performance requirements.
 - .2 Sustainability Standards Certification:
 - .1 Construction Waste Management: provide copy of plan.
 - .2 Recycled Content:
 - .1 Provide listing of recycled content products used.
 - .2 When Supplementary Cementing Materials (SCMs) are used, provide evidence to certify reduction in cement from Base Mix to Actual SCMs Mix, as percentage.

1.6 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 the Departmental Representative.
- .2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.
- .3 Packaging Waste Management: remove for reuse, recycling or elimination in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 DESIGN CRITERIA

- .1 Performance : to CSA A23.1/A23.2, and as described in MIXES of PART 2 - PRODUCTS.

2.2 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 PART 1 - QUALITY ASSURANCE.

2.3 MATERIALS

- .1 Cement: to CSA A3001, Type GUb – SF ou GUb-F/SF.
- .2 Water: to CSA A23.1/A23.2
- .3 Reinforcing bars: to CAN/CSA-G30.18, Grade 400W.
- .4 Pieces of hardware and sundry equipment: to CSA-A23.1/A23.2.
- .5 Concrete forming: CAN/CSA-S269.3-FM92 and CAN/CSA-A23.4.
- .6 Anchors and supports: to CAN/CSA-G40.21, type 300W, galvanized.
- .7 Galvanizing: Hot-Dip Galvanized, 610 g/m², to ASTM A-123
- .8 Air-entraining admixture : to ASTM C260.
- .9 Admixture
 - .1 Set accelerator are not authorized
 - .2 It's forbidden to use some chloride of calcium or materials which contain it.
 - .3 Super plasticizing, water reducer and retarder: to ASTM C494
- .10 Shim spacer: plastic
- .11 Sealer: boiled linseed oil to ASTM D260
- .12 Welded steel wire fabric: to ASTM A185.
- .13 Premoulded joint filler:
 - .1 Bituminous impregnated fibreboard: to ASTM D1751.

- .14 Joint sealer/filler: grey to CAN/CGSB-19.24, Type 1, Class B.

2.4 MIXES

- .1 Concrete 1 – (Slab, wall, Deadmen, bases and other standard use)
- .1 Performance Method for specifying concrete: to meet Departmental Representative performance criteria to CSA A23.1/A23.2.
- .1 Ensure concrete supplier meets performance criteria as established below and provide verification of compliance as described in standard 3101, Tome VII, Concrete normal density, Concrete type V.
- .2 Provide concrete mix to meet following plastic state requirements:
- .1 Water / cement ratio: less than 0.45
- .2 Water: 340-365 kg/m³ of concrete (see tome VII)
- .3 Aggregate size: 2.5-10 mm maximum.
- .4 Air content: 5-8%
- .5 L bar: 230 micrometers.
- .6 Slump at time and point of discharge: 80mm ± 30mm
- .3 Provide concrete mix to meet following hard state requirements:
- .1 Durability and class of exposure: C-1
- .2 Compressive strength at 28 days age: 35 MPa minimum.
- .3 Intended application: Pedestrians, medium/light vehicle's traffic
- .4 Finishability: lightly brushed non-slip finish.
- .5 Permeability in the ions chlorinates: 1500 Coulombs
- .4 Submit a management plan of the quality to assure the quality control of the concrete according to the specified performance requirements.
- .5 Concrete supplier's certification
- .2 Concrete 2 – (Roc anchors, repair of sheet piles)
- .1 Self leveling concrete
- .2 Performance Method for specifying concrete: to meet Departmental Representative performance criteria to CSA A23.1/A23.2.
- .1 Ensure concrete supplier meets performance criteria as established below and provide verification of compliance as described in standard 3101, Tome VII, chapter 3, Concrete type XIV-C.
- .2 Provide concrete mix to meet following plastic state requirements:
- .1 Water / cement ratio: less than 0.45
- .2 Water: 400 kg/m³ of concrete (see tome VII)
- .3 Aggregate size: 5-14mm maximum.
- .4 Air content: 6-9%
- .5 L bar: 230 micrometers.
- .6 Spread: 625mm ± 50mm
- .3 Provide concrete mix to meet following hard state requirements:
- .1 Durability and class of exposure: C-1

- .2 Compressive strength at 28 days age: 35 MPa minimum.
- .3 Permeability in the ions chlorinates: 1000 Coulombs
- .4 Submit a management plan of the quality to assure the quality control of the concrete according to the specified performance requirements.
- .5 Concrete supplier's certification

Part 3 Execution

3.1 PREPARATION

- .1 Provide Departmental Representative 24 hour notice before each concrete pour.
- .2 Coordinate every sequence of concreting with the test laboratory indicated by the Departmental Representative for testing and sampling during concreting
- .3 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.
- .4 During concreting operations:
 - .1 Development of cold joints not allowed.
 - .2 Ensure concrete delivery and handling facilitates placing with minimum of rehandling, and without damage to existing structure or Work.
- .5 Protect previous Work from staining.
- .6 Clean and remove stains prior to application of concrete finishes.

3.2 INSTALLATION/APPLICATION

- .1 Do cast-in-place concrete work in accordance with CSA A23.1/A23.2.
- .2 Sleeves and inserts:
 - .1 Cast in sleeves, ties, slots, anchors, reinforcement, frames, conduit, bolts, waterstops, joint fillers and other inserts required to be built-in.
 - .2 Sleeves and openings greater than 100 mm x 100 mm not indicated, must be reviewed by Departmental Representative.
- .3 The Contractor have to plan all the material and the equipment required for concreting during cold weather.

3.3 FINISHES

- .1 Formed surfaces exposed to view: [sack rubbed finish] in accordance with CSA A23.1/A23.2.
- .2 Wharf concrete slab
 - .1 Finishing operations followed by final finishing comprising mechanical floating and wood trowelling to provide lightly brushed non-slip finish.
 - .2 Provide round edges and joint spacings using standard tools.
- .3 Walkway and curbs:
 - .1 Finishing operations followed by final finishing comprising mechanical floating and wood trowelling

- .2 Provide round edges and joint spacings using standard tools.

3.4 CONTROL JOINTS

- .1 Cut or form control joints in slabs on grade at locations indicated, to CSA A23.1/A23.2 and install specified joint sealer/filler.

3.5 EXPANSION AND ISOLATION JOINTS

- .1 Install premolded joint filler in expansion and isolation joints full depth of slab flush with finished surface to CSA A23.1/A23.2.

3.6 CURING

- .1 Use curing compounds compatible with applied finish on concrete surfaces free of bonding agents and to CSA A23.1/A23.2.
- .2 For concrete slab, wet curing is mandatory.

3.7 SEALING APPLICATION

- .1 After curing is complete, apply two (2) even coats of linseed oil mixture to clean dry surfaces, each at 8 m²/L. Allow first coat to dry before applying second coat.

3.8 SITE TOLERANCES

- .1 Concrete floor slab finishing tolerance to CSA A23.1/A23.2.

3.9 FIELD QUALITY CONTROL

- .1 Concrete testing: to CSA A23.1/A23.2 by testing laboratory designated and paid for by Departmental Representative.

3.10 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
- .2 Use trigger operated spray nozzles for water hoses.
- .3 Designate cleaning area for tools to limit water use and runoff.
- .4 Cleaning of concrete equipment to be done in accordance with Section 01 35 43 Environmental Procedures.
- .5 Waste Management: separate waste materials for reuse, recycling or elimination 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 can be safely washed.
 - .3 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.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 03 10 00 – Concrete forming and accessories
- .2 Section 03 30 00.01 – Cast-in-place concrete

1.2 REFERENCES

- .1 Definitions:
 - .1 Tremie concrete: concrete placed underwater through tube called tremie pipe.
 - .2 Tremie pipe: pipe has hopper at upper end and may be open ended or may have foot valve, plug or travelling plug to control flow of concrete. Pipe has diameter of 200 mm minimum, constructed from sections with flange couplings fitted with gaskets.
 - .1 Concrete is placed in hopper and sufficient head of concrete is maintained in tremie pipe to provide desired rate of flow.
 - .3 Pumped concrete method: method of placing concrete underwater uses concrete pump with discharge line used in similar manner to tremie pipe.
 - .4 Bottom-dump bucket method: method of placing concrete underwater requires use of bucket designed to discharge from bottom after it has contacted foundation or surface of previously placed concrete.
 - .5 Bagged concrete method: method of placing underwater concrete consists of diver placing bags partially filled with dry concrete mix.
- .2 Reference Standards:
 - .1 American Concrete Institute (ACI)
 - .1 ACI 304R-00, Guide for Measuring, Mixing, Transporting and Placing Concrete.
 - .2 CSA International
 - .1 CSA A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for concrete and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 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.

Part 2 Products

2.1 MATERIALS

- .1 Concrete materials: to Section 03 30 00.0 - Cast-in-Place Concrete (short form)

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for concrete placement 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 INSTALLATION

- .1 Do concrete work in accordance with Section 03 30 00.01 - Cast-in-Place Concrete short form and to CSA A23.1/A23.2. Testing for concrete to CSA A23.1/A23.2.
- .2 Where concrete placement extends above water surface, protect concrete from direct contact with air at temperature below 5 degrees C for 3 days.
- .3 Place concrete in one continuous operation to full depth required.
 - .1 Supply complete equipment for every phase of operation.
 - .2 Provide sufficient supply of concrete to complete pour without interruption.
- .4 Tremie method:
 - .1 Provide water-tight tremie pipe sized to allow free flow of concrete. Diameter of tremie pipe to be minimum 200 mm and minimum eight times maximum size of coarse aggregate.
 - .2 Provide hopper at top of tremie pipe and means to raise and lower tremie pipe.
 - .3 Provide plug or foot valve at bottom of tremie pipe to permit filling pipe with concrete initially.
 - .4 Provide minimum of one tremie pipe for every 30 m² of plan area and to maximum spacing of 6 m centre to centre. Do not move tremie pipes laterally through concrete.
 - .5 Start placement with tremie pipe full of concrete. Keep bottom of pipe buried minimum 900 mm in freshly placed concrete.
 - .6 If seal is lost, allowing water to enter pipe, withdraw pipe immediately. Refill pipe, and continue placing as specified.
 - .7 Do not place concrete in flowing water when current exceeds 3 m/min.
- .5 Pumped concrete method:

- .1 Follow procedures as for tremie method in placing concrete using discharge line from concrete pump as tremie pipe.
- .2 Pump discharge line diameter: 125 mm minimum.
- .6 Bottom-dump bucket method:
 - .1 Bottom-dump bucket method is not allowed

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, recycling or elimination in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A185/A185M-05a, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
 - .2 ASTM C260-01, Standard Specification for Air-Entraining Admixtures for Concrete.
 - .3 ASTM A-123, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 - .4 ASTM C494 / C494M - 15a, Standard Specification for Chemical Admixtures for Concrete.
- .2 Ministère des Transports du Québec
 - .1 3101 Standard, Volume VII, Chapter 3, standard concrete weight
 - .2 3601 Standard, Volume VII, Chapter 3, Concrete waterproofing
- .3 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1/A23.2-F2014, Béton-Constituants et exécution des travaux / Méthodes d'essai et pratiques normalisées pour le béton.
 - .2 CAN3-A23.3-(R2010), Calcul des ouvrages en béton.
 - .3 CSA-A23.4-F09, Béton préfabriqué : Constituants et exécution.
 - .4 CAN/CSA-A3000-F13, Compendium de matériaux liants
 - .5 CAN/CSA-A3001-F13, Liants utilisés dans le béton.
 - .6 CAN/CSA-G30.18-FM92 (C2012), Barres d'acier en billettes pour l'armature du béton.
 - .7 CAN/CSA-G40.20/G40.21-F2004, Exigences générales relatives à l'acier laminé ou soudé/acier de construction.
 - .8 CAN/CSA-S6-F2014, Code canadien sur le calcul des ponts routiers.
 - .9 CSA-W47.1-F03, Certification des compagnies de soudage par fusion de l'acier.
 - .10 CAN/CSA W48-F014, Métaux d'apport et matériaux associés pour le soudage à l'arc (élaborée en collaboration avec le Bureau canadien de soudage).
 - .11 CSA-W59-F03, Construction soudée en acier (soudage à l'arc) (unités métriques).
 - .12 CSA-W186-FM1990 (C2012), Soudage des barres d'armature dans les constructions en béton armé.
 - .13 CAN/CSA-S269.3-FM92 (C2013), Coffrages, Norme nationale du Canada.

1.2 DESIGN REQUIREMENTS

- .1 Design precast elements to CSA-A23.3 and CSA-A23.4 to carry handling stresses.

- .2 Design lifting lugs for handling of precast elements to be sure that they can withstand the loads during handling, in compliance with the applicable codes and, the plans and estimates.
- .3 Design fittings and attachment system of precast concrete elements depending on the loads and forces specified by the Departmental Representative.
- .4 Submit design drawings and detailed calculations required for precast concrete elements and the standard assembly elements in accordance with the requirements stated in section 1.7 - DOCUMENTS/SUBMITTALS, in PART 1.

1.3 PERFORMANCE REQUIREMENTS

- .1 The allowances and gaps for structural precast concrete elements shall conform to CSA-A23.4 standards.
- .2 The positive or negative deviation of the actual length and the nominal length of the precast elements shall not exceed 5 mm.
- .3 The positive or negative deviation of the actual section and the nominal section of the precast elements shall not exceed 3 mm.
- .4 The deviation from a straight line shall not exceed a length of 3 mm by 3 m.
- .5 The positive or negative deviation (bias) between the horizontal rectangular form of precast elements and the rectangular reference shall not exceed 3 mm, as measured by the difference in the length across.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit WHMIS MSDS - Material Safety Data requested.
- .3 Submit shop drawings in accordance with CSA-A23.3 and CSA-A23.4 and include following items:
 - .1 Design calculations for items designed by manufacturer.
 - .2 Details of prestressed and non-prestressed members, reinforcement and their connections.
 - .3 Camber.
 - .4 Finishing schedules.
 - .5 Methods of handling and erection.
 - .6 Openings, sleeves, inserts and related reinforcement.
- .4 Submit, two (2) weeks before the start of production, one (1) soft copy of the design drawings and detailed calculations of standard precast and assembly elements for review by the Departmental Representative.
- .5 Shop Drawings: submit drawings stamped and signed by qualified professional engineer registered or licensed in Province of Quebec, Canada.
- .6 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

- .7 Send the implementation schedule to the Departmental Representative at least two (2) weeks in advance to ease for coordination at the plant.

1.5 QUALITY ASSURANCE

- .1 Quality Control Plan: submit written report, as described in PART 3 - VERIFICATION, to Departmental Representative verifying compliance that concrete provided meets performance requirements of concrete as established in PART 2 - PRODUCTS.
- .2 Replace, at no additional cost, damaged products to the satisfaction of the Departmental Representative

1.6 QUALIFICATIONS

- .1 Fabricate and erect precast concrete elements by manufacturing plant certified in appropriate categories according to CSA-A23.4
- .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 category, which are precast structural concrete products.
- .3 Only precast elements fabricated in such certified plants to be acceptable to Departmental Representative 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 contacting earth to prevent from staining.
- .3 Waste Management and Disposal:
 - .1 Separate waste materials for reuse/recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .4 Untreated wood must be supplied during offloading on which the items will be placed so as to avoid any direct contact with the ground, or with each other.
- .5 At least, evenly support, each element at a quarter ($\frac{1}{4}$), half ($\frac{1}{2}$) or three-quarters ($\frac{3}{4}$) length, or following the manufacturer's directives.

1.8 WARRANTY

- .1 The Contractor hereby certifies that the precast elements are guaranteed against spalling and against any other obvious signs of cracks or corrosion of embedded steel elements, except normal hairline cracks due to shrinkage, except to what relates to the warranty period, which is two (2) years.

Part 2 Products

2.1 MATERIALS

- .1 Cement to CAN/CSA-A3001, Type GU_b-SF / GU_b-F/SF.
- .2 Water: to CSA-A23.1/A23.2.
- .3 Reinforcing steel: to CAN/CSA-G30.18, and to specs and plans.
- .4 Hardware and miscellaneous materials: to CSA-A23.1/A23.2.
- .5 Forms: to CAN/CSA-S269.3-FM92 et CAN/CSA-A23.4.
- .6 Anchors and supports: to CAN/CSA-G40.21 Type 300 W, galvanized.
- .7 Welding materials: to CSA W48.
- .8 Welding electrodes: to CSA W48 certified by Canadian Welding Bureau.
- .9 Galvanizing: hot dipped galvanizing with minimum zinc coating of 610 g/m² to ASTM A-123.
- .10 Air entrainment admixtures: to ASTM C260.
- .11 Chemical admixtures:
 - .1 Setting accelerators are not allowed
 - .2 It is forbidden to use calcium chloride or materials containing it.
 - .3 Super-plasticizer, water reducer, setting retarder in compliance with ASTM C494 standards.
- .12 Shims: plastic.

2.2 MIXES

- .1 Concrete
 - .1 Performance Method for specifying concrete: to meet Departmental Representative performance criteria in accordance with CAN/CSA-A23.1/A23.2.
 - .1 Ensure that the concrete supplied meets the performance criteria of the 3101 standard, Volume VII, Chapter 3, standard concrete weight, V-P type concrete.
 - .2 In the plastic state, the concrete mixture must comply with the following requirements.
 - .1 Water/cement ratio: less than 0.45
 - .2 Minimum cement content: 390-410 kg/m³ (see Volume VII)
 - .3 Nominal size of coarse aggregate: 5-20 mm.
 - .4 Air content: 5-8 %
 - .5 Sagging before the addition of super-plasticizer: 80mm ± 30mm
 - .3 Provide concrete mix to meet following hard state requirements:
 - .1 Durability and class of exposure: C-1.
 - .2 Minimum compressive strength at 35 MPa – 28 days.

- .3 Intended application: traffic of light to medium-sized vehicles and pedestrians.
- .4 Surface Texture: slip resistant surface - brush finish.
- .5 Geometrical requirements: 0% slope.
- .6 Permeability to chlorine ions: 1500 Coulombs
- .4 Provide quality management plan to ensure verification of concrete quality to specified performance.
- .5 Concrete supplier's certification.
- .2 Repair and sealer
 - .1 The manufacturer of precast elements must provide a procedure and a dosage formula for concrete/grout/mortar to fill the spaces left by the lifting equipment. The product offered by the manufacturer must adhere well to the elements, blend with the colour of the elements and have mechanical performance similar to that of the elements.
 - .2 Shrinkage compensated grout: complies with Section 03 30 00.01 - Concrete poured on site (abridged version).

2.3 MANUFACTURED UNITS

- .1 Manufactured units in accordance with CSA-A23.4.
- .2 Mark each precast unit to correspond to identification mark on shop drawings for location with date cast on part of unit not be exposed. These marks shall be placed on a section of the concealed item once the work is completed.
- .3 Hardware such as lifting lugs embedded in the precast elements and suitable for handling precast elements must be supplied.
- .4 The design of the lifting lugs must conform to CSA-A23.3 and CAN/CSA-S6 standards.
- .5 After the shaping is done, the lifting equipment and steel parts to be embedded should be galvanized.

2.4 FINISHES

- .1 Surface finishing should follow CAN/CSA-A23.4 standards.
- .2 Bases: The items must have a commercial grade finish on all surfaces.
 - .1 Surfaces with rounded edges and joints made with spacers, using common tools.

2.5 SOURCE QUALITY CONTROL

- .1 Provide Departmental Representative with certified copies of quality control tests related to this project as specified in CSA-A23.4.
- .2 Provide records from in-house quality control program 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-A23.4, CSA-A23.3 et CAN/CSA-S6.
- .2 Carry out welding work in accordance with CSA-W59 standards for welding lifting equipment.
- .3 Erect precast elements within allowable tolerances as indicated.
- .4 Erection tolerances to CSA-A23-4. Non-cumulative erection tolerances only.
- .5 Set elevations and alignment between units to within allowable tolerances before connecting units.
- .6 Grout underside of unit bearing plates with shrinkage compensating grout.
- .7 Fasten precast units in place as indicated on approved shop drawings.
- .8 Fit precast elements using lag screws fitted with lock washers.

3.2 VERIFICATION

- .1 Quality Control Plan: ensure concrete supplier meets performance criteria of concrete as established in PART 2 - PRODUCTS, by Departmental Representative and provide verification of compliance as described in PART 1 - QUALITY ASSURANCE.

3.3 PROTECTION

- .1 Protect all installed materials and elements against damage during construction.
- .2 Repair damages caused to adjacent materials and equipment by placing precast concrete elements.

3.4 CLEANING

- .1 Use cleaning methods as approved by Departmental Representative before cleaning soiled precast concrete surfaces.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 ASTM International
 - .1 ASTM A53/A53M-07, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A269-08, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
 - .3 ASTM A307-07b, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - .4 ASTM A-123, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 - .5 ASTM A153, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 - .6 ASTM F2329, Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners
- .2 CSA International
 - .1 CSA G40.20/G40.21-F04 (C2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA S16-09, Design of Steel Structures.
 - .3 CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
 - .4 CSA W59-M03 (R2008), Welded Steel Construction (Metal Arc Welding).
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.61-2004, Exterior and Interior Enamel Alkyd, Marine.
 - .2 CAN/CGSB-1.212-2004, Primer without chromate or lead, marine, for steel surfaces and light alloy.
- .4 Green Seal Environmental Standards (GS)
 - .1 GS-11-2008, 2nd Edition, Paints and Coatings.
- .5 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .6 The Society for Protective Coatings (SSPC)
 - .1 SSPC, Surface preparation standards.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:

- .1 Submit manufacturer's instructions, printed product literature and data sheets for sections, plates, pipe, tubing, bolts. Include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Submit one (1) copy of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements and 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 Quebec, Canada.
 - .2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.
- .4 Welding
 - .1 Provide written description of welding procedure for Departmental Representative approval two (2) weeks before the beginning of work, when requested by said Departmental Representative.

1.3 QUALITY ASSURANCE

- .1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certifications: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .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, in clean, dry, well-ventilated area in accordance with manufacturer's recommendations.
 - .2 Replace defective or damaged materials with new.

1.5 MANAGEMENT AND DISPOSAL OF WASTE

- .1 Sort recyclable waste materials or dispose in accordance with Section 01 74 21 - Management and disposal of construction/demolition waste.

Part 2 Products

2.1 MATERIALS

- .1 Steel sections and plates: to CSA G40.20/G40.21, Grade 350W.

- .2 Galvanized steel: hot-dip galvanizing with a zinc coating of at least 600 g/m², in accordance with ASTM A123/A123M standards. Drilling and welding should be done before galvanizing. Provide ventilation holes to ease galvanizing.
- .3 Steel pipe: to ASTM A53/A53M.
- .4 Welding materials: to CSA W59.
- .5 Welding electrodes: to CSA W48 Series. For under water welding, electrodes conform to Broco Softouch type.
- .6 Bolts and anchor bolts: to ASTM A307.
- .7 Nuts and washers: according to the requested bolt, so as to get its full capacity. Nuts will be lubricated according to standard A563.
- .8 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

2.2 FABRICATION

- .1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .2 Use self-tapping shake-proof flat headed screws on items requiring assembly by screws or as indicated.
- .3 Where possible, fit and shop assemble work, ready for erection.
- .4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

2.3 FINISHES

- .1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m² to CAN/CSA-G164.

2.4 SHOP PAINTING

- .1 Metal components, except for galvanized parts must be coated with a primer layer in a workshop.
- .2 A primer layer applied in the workshop with marine vermilion red complies with CAN/CGSB-1212 standards and/or the requirements for the product.
- .3 Two finishing layers, applied in the workshop, with the colour specified by the element comply with CAN/CGSB-1.61 standards and/or the requirements for the product.
- .4 The surfaces to be welded on site must be cleaned and should not be coated with paint.

2.5 PROTECTION POSTS (FIXED AND REMOVABLE)

- .1 Manufactured according to the plans and estimates
- .2 Type of steel: 350W
- .3 Structural steel conforming to CSA G40.20 / G40.21 standards.
- .4 Preparation of the steel surface according to SSPC-SP5 white blasting standards
- .5 A primer layer applied in the workshop with marine vermilion red complies with CAN/CGSB-1212 standards and/or the requirements for the product.

- .6 Two finishing layers, applied in the workshop, with yellow colour comply with CAN/CGSB-1.61 standards and/or the requirements for the product.
- .7 Alterations may be done if the steel is exposed; the same painting system as described in 2.5 (items 5 to 6).
- .8 Grout: Non-metallic, shrinkage compensation
- .9 Concrete: 35 MPa
- .10 Anchors and attachments: As shown in the plans

2.6 ACCESS LADDERS

- .1 Ladders will be made of galvanized steel and constructed as shown in the plans.
- .2 Dimensions and details: As shown in the plans
- .3 Mounting brackets: As shown in the plans
- .4 Alterations on the site. Automatically remove any rust and use a brush to apply two (2) generous coats of a rich zinc coating with more than 95% of zinc. Spraying will not be allowed.

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 ERECTION

- .1 Do welding work in accordance with CSA W59 unless specified otherwise.
- .2 Submarine welds should comply with standard ANSI/AWS D3.65. Welds must be of type C.
- .3 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .4 Provide suitable means of anchorage acceptable to Departmental Representative such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.
- .5 Exposed fastening devices to match finish and be compatible with material through which they pass.
- .6 Supply components for work by other trades in accordance with shop drawings and schedule.

- .7 Make field connections with bolts to CSA S16.
- .8 Deliver items over for casting into concrete and building into masonry together with setting templates to appropriate location and construction personnel.
- .9 Touch-up rivets, field welds, bolts and burnt or scratched surfaces with primer after completion.
- .10 Install curbs, access bollards and rescue ladders where indicated and as shown in the plans
- .11 Departmental Representative can proceed any time with non-destructive testing of the welds made on the working-site. The costs of these tests will be paid for by the Department.
- .12 Contractor will give access and facilitate the welds examination by the departmental Representative at no extra cost for the Department.
- .13 If the welds examination reveals any defect, it should be repaired and re-inspected by the Departmental Representative. The Contractor will have to change his welding procedure so as to eliminate all failures noted. The repairs and the second inspection will be paid for by the Contractor.
- .14 Allow the Departmental Representative to proceed with inspection either at the fabrication, erection and/or assembly plant.
- .15 Report to Departmental Representative any failure in the material or any assembly problem on the working-site. In the occurrence of any repairs, they should be made at the Departmental Representative's utmost satisfaction.
- .16 The underwater welders will be qualified by the Departmental's Representative. The cost of the corrosion samples and testing will be paid for by the Contractor. The welders that will not be qualified will not be authorized to proceed.

3.3 INSTALLATION OF EQUIPMENT AND GROUTING

- .1 Install all mooring equipment at the indicated location and elevations.
 - .1 After tightening the anchor bolts or placing shims, inject the grout at the base of the mooring equipment.
 - .2 Ensure that the temperatures of the foundation, air, base and grout fall within the limits specified by the manufacturer of the grout.
- .2 Do not inject grout before the approval of the anchor bolt sitting and mooring terminals by the Departmental Representative.

3.4 ALTERATIONS ON THE SITE

- .1 Painted steel
 - .1 Automatically remove any rust.
 - .2 A primer layer applied in the workshop with marine vermilion red complies with CAN/CGSB-1212 standards and/or the requirements for the product.
 - .3 Two finishing layers, applied in the workshop, with the colour specified by the element comply with CAN/CGSB-1.61 standards and/or the requirements for the product.

- .2 Galvanized steel
 - .1 Automatically remove any rust.
 - .2 Touch up galvanized surfaces at those spots that were damaged during welding or installation, by using a brush to apply two (2) generous coats of rich zinc coating with more than 95% of zinc. Spraying will not be allowed.

3.5 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/recycling or elimination in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

3.6 PROTECTION

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

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 This section includes the specific technical clauses for the execution of the cathodic protection system elements.

1.2 RELATED SECTIONS

- .1 Section 01 11 00 – Work related general information
- .2 Section 01 14 00 - Restrictions on Works
- .3 Section 05 12 23 – Metal Fabrications

1.3 REFERENCES

- .1 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 Work to be executed. The federal laws and regulations prevail on the other codes and standards.

ANSI, American National Standards Institute
API, American Petroleum Institute
ASME, American Society of Mechanical Engineers
ASM, American Society for Metals
ASTM, American Society for Testing and Materials
AWS, American Welding Society
AWWA, American Water Works Association
BNQ, Bureau de Normalisation du Québec
CEMA, Canadian Electrical Manufacturers Association
CEQ, Quebec Electrical Code
CGSB, Canadian Government Standard Board
CPQ, Quebec Plumbing Code
CSA, Canadian Standards Association
CSST, Code de sécurité pour les travaux en construction
MENVIQ, Ministère de l'Environnement du Québec
NACE, National Association of Corrosion Engineers
NBC, National Building Code
NFPA, National Fire Protection Association
SSPC, Steel Structures Painting Council
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, the Contractor must not restrict himself to the application of the above-mentioned standards only, but he must rather comply with all the standards to which his work could be related to.

1.4 CONTRACTOR'S COMPETENCE

- .1 Contractor should have personnel being qualified for the equipments fabrication and for the cathodic protection system installation and in electricity.

1.5 VERIFICATION OF BASIC DATA FOR THE PROJECT REALIZATION

- .1 Contractor must verify himself the basic data required for the project whole realization. He must ensure he has on hand all the information required for the installation and good operation of the system. The Owner will supply only him all the data available. If they are required, all additional tests, site visits or other actions necessary to the project realization will be at the Contractor's charge.
- .2 The approximate bathymetry is indicated on the plans. Before starting the installation, Contractor should verify the bathymetry to have the precise measurements of the equipment location and check if any obstacles prevent any work execution on the worksite. Afterwards, the bathymetry results will be submitted for approval to Department Representative, with the shop drawings showing the anodes assembly and the cables connections.

1.6 SHOP DRAWINGS

- .1 Ten (10) days after award of contract, the Contractor must give to the Department Representative the list of shop works he intends to make before beginning the work *in situ*.
- .2 The Department Representative will proceed to various inspections of these shop works. The Contractor should give all the facilities to the Department's representative so they have access and can properly examine the components and assemblies at various stages upon the Department Representative's request.
- .3 The inspections do not reduce in any way the Contractor's responsibility regarding the quality of his materials and workmanship.

1.7 WORKS DESCRIPTION

The work consists in the installation of marine aluminum sacrificial anodes (Type I anodes) on the C face and partially on the B face of the wharf at the place shown on attached plans. The Contractor will obtain all the necessary information for the Work in the plans attached on the specifications.

The Contractor will also install three insulated anodes (Type II anodes), a reference electrode and a corrosion sample. The reference electrode cables will be installed in the same manner as the anode's cables. Then, the cables will be routed through conduits to the control box that will be installed according to the indications on the plans.

On the faces A and F and partially on the face B of the wharf, the contractor must install Type III sacrificial anodes buried in the seabed.

1.8 DOCUMENTS/SAMPLES TO BE SUBMITTED

- .1 Submit required technical data sheet as well as manufacturers' specifications and documentation regarding products, as per section 01 33 00.

1.9 MINIMUM REQUIREMENTS

- .1 The specifications and plans give the minimum requirements for the Work execution. The Work should be executed in accordance with the other regulations and codes in force in the province of Quebec.

Part 2 Products

2.1 GENERAL

- .1 All the materials used for the installation of the wharf cathodic protection system should be designed for a marine environment.

2.2 SACRIFICIAL ANODES

- .1 The sacrificial anodes are of five (5) types, as indicated on the plans.
- .2 The anodes dimensions and fabrication details are indicated on the plans.
- .3 In all cases, the anode steel core should be made so that the anode is adequately adhered to the core. Before commencing the anodes fabrication, manufacturer must submit for approval the manufacturing details of the central core. The core must be made of carbon steel that can be welded with carbon equivalent less than 0.40%. Remove the oxide on the core by sand blasting.
- .4 Particular attention should be brought upon the anodes casting to avoid formation of internal gas pouches so that the anodes do not tend to come up to the water surface. Shrinkage filling after solidification is now allowed. A maximum tolerance of $\pm 3\%$ in weight is acceptable. All the anodes must be inspected before delivery on the worksite. The inspection will be done at the Contractor's or at any other location in the Province of Quebec. The moving and handling costs of anodes will be at the expense of the contractor.
- .5 The chemical composition of the anodes should correspond to:

Zn: 2,8% to 6,5%
In: 0,01% to 0,02%
Si: 0,08% to 0,2%
Cu: 0,006% max
Fe: 0,12% max
Al: balance

The mercury activated anodes are not accepted. Manufacturer must provide, upon inspection, the chemical analysis and the weight certificate. All anodes must be

identified by number and casting number. All anode characteristics must be in accordance with NACE SP0387 and/or specification requirements.

- .6 The closed-circuit potential of the anodes shall be -1.08 V and the anode capacity of 2600 Ah / Kg. Adjust the chemical composition of the anodes to obtain these properties. The tests must be done according to NACE TM 0190 Standard. Provide the laboratory analysis certificates from the manufacturer of the anodes.
- .7 The surface of each anode corresponding to the sheet pile face will be covered with an epoxy paint layer. The paint should be compatible with the anode aluminum surface and resist to sea-water immersion. Before the paint application, manufacturer should submit for approval the system he intends to use. Manufacturer should prepare the surfaces according to the paint manufacturer instructions. The paint application should also be submitted for Department Representative's approval with a sample of such. The paint application will be shop made according to the moisture and temperature conditions prescribed by paint manufacturer. In all cases, the surfaces should be prepared by sandblasting in order to get a proper adherence and cleaned with a compatible solvent. The drying time will comply with the paint technical data. Upon transportation, the painted surfaces should be protected against scratches.

2.3 REFERENCE ELECTRODE

- .1 Reference electrode are Borin Stelth type, model SRE-004-SFB, specifically designed for sea-water utilization (silver – silver chloride electrode).
- .2 References electrode are protected by a PVC conduit, as indicated on plans.

2.4 ELECTRICAL CABLES AND CONNECTIONS

- .1 All the electrical cables must be specifically designed to permanently resist to sea-water. Contractor must supply a certification of such.
- .2 The anodes cables must be double insulated and H.M.W.P.E. type. The dimension of the cables is AWG No 8.
- .3 The anodes will be connected in advance on the anodes and on the reference electrodes. The length of the cables should be sufficient for their connection to the control box.
- .4 The other DC cables should be designed for marine environment.

2.5 SERVICE STATION

- .1 The minimum specifications of the service station box are indicated on the plans. The supplier can provide other types of service station boxes. The box should be NEMA type in PVC or the equivalent.

2.6 OTHER EQUIPMENT

- .1 All the other equipment must be made according to the standards in force.

2.7 MATERIALS USED

- .1 It is not allowed to use materials other than those CSA approved. The electrical equipment must comply with the Quebec Electrical Code.
- .2 All the materials should be designed for marine environment.

Part 3 Execution

3.1 INSULATED ANODES PREPARATION

- .1 The anodes will be shop made. Anodes should be carefully inspected by Contractor before commencing assembly.
- .2 Contractor must assemble the anodes as indicated on plans.
- .3 The anode fixation to the electrical conductor will first be made with a mechanical connector followed by a weld joint.
- .4 Contractor must be sure the polypropylene sleeve will separate the anode core from the other components that will be welded afterwards on the wharfpiles.

3.2 REFERENCE ELECTRODE PREPARATION

- .1 The reference electrode will be installed in PVC conduit as indicated on the plans.
- .2 The live part of the reference electrode should be cleared off to allow the reading of the structure potential.
- .3 The reference electrode must be verified before delivery on the site. Provide after installation the potential of the reference electrode.
- .4 The reference electrode has its own negative cable installed as indicated on the plans.

3.3 CONTROL BOXE PREPARATION

- .1 Contractor must install the control boxe in the components indicated on the plans.

3.4 CONNECTING OF THE CABLES AND OF ELECTRICAL CONNECTIONS

- .1 The anodes cables will be fixed on the pile by means of steel angle-iron welded as indicated on the plans.
- .2 The electrical cable of the negative pole will be fixed to the piles as indicated on the plans.

3.5 INSTALLATION OF THE OTHER EQUIPMENT

- .1 The other components and equipment will be installed according to the rules of good practice and to the standards and codes in force.

3.6 PROTECTION OF THE PUBLIC

- .1 During the works, the Contractor must prevent the public to have access to the hazardous sites. He must provide protected working zones.
- .2 All the electrical components must be installed so that the public cannot have access to said components.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 31 53 13.01 – Timber Cribwork

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA O80 Series-97(R2002) - O80S2-05, Wood Preservation.
 - .2 CSA O80.201-M89, This Standard covers hydrocarbon solvents for preparing solutions of preservatives.

1.3 ACTION/INFORMATIONAL SUBMITTALS

- .1 Submit submittal submissions: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Quality assurance submittals:
 - .1 Submit certificates in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 For products treated with preservative by pressure impregnation submit following information certified by authorized signing officer of treatment plant:
 - .1 Moisture content after drying following treatment with water-borne preservative.
 - .2 Acceptable types of paint, stain, and clear finishes that may be used over treated materials to be finished after treatment.

1.4 QUALITY ASSURANCE

- .1 Inspection and testing of materials intensively treated with a preservative will be done by a designated testing laboratory in accordance with CSA O80 standard. Provide quality assurance documents immediately after the completion of the first inspections and tests during production to enable continuous verification of results by the Departmental Representative. For each delivery of treated wood, the Contractor shall provide the Departmental Representative, at least 7 days before delivery, with a certificate of conformity containing the following information for each batch of production:
 - .1 The essence of the treated wood, as well as its density (kg/m3);
 - .2 The proportion of the surfaces/sapwood;
 - .3 The name and membership of the recognized classification agency;
 - .4 The identity of the treatment plant;
 - .5 The type of preservative;
 - .6 The date of treatment and the date of sampling;
 - .7 The number in the production batch of the treatment;
 - .8 The volume of treated wood in cubic meters of the production batch;
 - .9 The nominal dimensions in mm and the amount of pieces in the production batch;

- .10 The results of the retention test (kg/m³) and the corresponding requirement of the CAN/CSA O80 standard, Wood Preservation;
- .11 The results of the penetration test (kg/m³) and the corresponding requirement of the CAN/CSA O80 standard, Wood Preservation;
- .12 The storage or shipping point.
- .2 The Departmental Representative will handle the recruitment of independent testing laboratories and inspection services to carry out additional checks, if deemed necessary, following the receipt of quality assurance reports from the Supplier. All costs will be charged to the Departmental Representative. If there are any inconsistencies, additional testing agency fees incurred due to the correction of inconsistencies will be charged to the Supplier.

1.5 DELIVERY, STORAGE, AND HANDLING

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

Part 2 Products

2.1 MATERIALS

- .1 Preservatives: odourless with water (water soluble) for treatment with salts, giving the wood a colourless finish and with the standards of CSA O80 series.
- .2 Preservatives: maximum VOC limit 350 g/L.

Part 3 Execution

3.1 APPLICATION: PRESERVATIVE

- .1 Treat all wood pieces following CAN/CSA-O80-M standard for use in salty water and depending on the selected essence, using preservative, until a net retention according to article 9.8.2.

3.2 APPLICATION: FIELD TREATMENT

- .1 Comply with CSA O80.
- .2 Any pressure treated material, requiring cutting, should be coated with three (3) layers of preservative while it is still dry, as required by CAN/CSA-080 standards. All holes made in the timber after the pressure treatment, should also be treated this way.
- .3 Remove chemical deposits on treated wood to receive applied finish.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 05 50 00 – Metal fabrication
- .2 Section 06 05 73 – Wood treatment
- .3 Section 31 53 13.01 – Timber Cribwork

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM A123/A123M-09, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM D1761-06, Standard Test Methods for Mechanical Fasteners in Wood.
 - .3 ASTM D5456-11, Standard Specification for Evaluation of Structural Composite Lumber Products.
 - .4 ASTM A307, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - .5 ASTM A153, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware (Spécifications pour revêtements de zinc (galvanisé à chaud) sur la quincaillerie d'acier et de fer)
 - .6 ASTM D1761, Standard Test Methods for Mechanical Fasteners in Wood.
 - .7 ASTM F1667, Driven Fasteners: Nails, Spikes, and Staples
 - .8 ASTM F2329, Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners
- .2 CSA International
 - .1 CSA O80 Series-15 Wood preservation
 - .2 CSA O121-08, Douglas Fir Plywood.
 - .3 CSA O151-09, Canadian Softwood Plywood.
 - .4 CSA O153-13 Poplar Plywood.
 - .5 CAN/CSA-Z809-2013, Sustainable Forest Management.
- .3 Forest Stewardship Council (FSC)
 - .1 FSC-STD-01-001, FSC Principle and Criteria for Forest Stewardship.
 - .2 FSC-STD-20-002, Structure, content and local adaptation of Generic Forest Stewardship Standards
- .4 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber 2010.
- .5 The Quebec Forest Industry Council (QFIC)

1.3 ACTION/INFORMATIONAL SUBMITTALS

- .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 wood products and accessories and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.

1.4 QUALITY ASSURANCE

- .1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Plywood, particleboard, OSB and wood based composite panels in accordance with CSA and ANSI standards.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 A storage facility for treated wood and assembly and pre-assembly of cribs has been designated and shown in the plans.
- .3 Storage and Handling Requirements:
 - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

1.6 MANAGEMENT AND DISPOSAL OF WASTE

- .1 Develop a construction waste management plan for the work covered by this section and in accordance with Section 01 74 21 - Management and disposal of construction/demolition waste.
- .2 Management of packaging waste: recover packaging waste for re-use/re-use and recovery of pallets, crates, quilting, other packaging materials by the manufacturer, following the guidelines of the waste management plan built in accordance with section 01 74 21 - Management and disposal of construction/demolition waste.
- .3 Transport unused metal elements to a metal recycling facility approved by the Departmental Representative

1.7 ACCESSORIES

- .1 Nails, spikes and staples: in compliance with ASTM F1667, Driven Fasteners: Nails, Spikes, and Staples.

Part 2 Execution

2.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product 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.

2.2 MATERIALS

- .1 Base parts:
 - .1 Base parts include the lower section of the crib. They will have 254 mm of rough trimming and will be placed longitudinally as required.
 - .2 Longitudinal beams at the base will have free ends as shown in the plans.
 - .3 They will be tied to each piece of wood they intersect, as shown in the plans.
 - .4 The base parts will be tied to each vertical post they intersect with a mechanical bolt of 25 mm in diameter and of suitable length. Base parts shall be laid horizontally.
- .2 Longitudinal members:
 - .1 The longitudinal members will consist of parts of 254 mm squaring placed horizontally, as shown in the plans. The lengths are determined using butt joints indicated in the plans.
 - .2 The longitudinal members will be tied at each intersection with a cross member or a frontage piece with a drift pin of 20 mm in diameter and of suitable length. They will be tied to each vertical post they intersect with a mechanical bolt of 25 mm in diameter and of suitable length.
- .3 Cross ties:
 - .1 The cross ties will consist of parts of 254mm squaring placed horizontally, as shown in the plans.
 - .2 The cross ties will have the same length throughout the project and will be tied to vertical posts with mechanical bolts of 25 mm in diameter and of suitable length.
 - .3 The cross ties will be tied at each intersection with a beam using a drift pin of 20 mm in diameter and of suitable length.
 - .4 Additional cross ties located under the joists and midway between the posts will be fixed by means of lost tip bolts.
- .4 Frontage timber:
 - .1 They will consist of wooden parts with 254 mm squaring placed horizontally, as shown in the plans.

- .2 They will be butt joined as indicated in the plans between the cross ties such that the joints are inverted from one row to another. Each joint will be supported by a wooden block with 254mm squaring, and with a length of 1200 mm and each end of the frontage timber will be tied to it, as shown in the plans.
- .3 The frontage timber for the crib will be tied at each intersection with a cross tie, a longitudinal member, another frontage piece with a drift pin of 20 mm in diameter. The frontage timber will also be tied at each vertical crossing with a post using a mechanical bolt of 25 mm in diameter and of suitable length.
- .4 Holes reaming is also required in some places indicated on plans to ease the proper installation of wooden parts.
- .5 Vertical posts:
 - .1 The vertical posts will consist of wooden parts with 254 mm squaring placed horizontally, as shown in the plans. No joints is allowed from below the base parts to the upper limit of joists.
 - .2 They will be tied at each intersection with a base part, cross tie, longitudinal member, frontage, crowning, with mechanical bolts 25 mm in diameter and of suitable length.
- .6 Joists:
 - .1 Treated wooden joists with 254 mm squaring will be installed on the crib as shown in the plans.
 - .2 The beams will be placed as shown in the various figures of the plans. They will be tied to each cross tie with a beam using a drift pin of 20 mm in diameter and of suitable length.

2.3 TREATMENT ON THE SITE

- .1 This should be done in compliance with CAN/CSA-080 standards.
- .2 Any pressure treated material, requiring cutting to be adjusted, should be coated with three (3) layers of preservative while it is still dry, as required by CAN/CSA-080 standards. The process will be completed by brushing to force the penetration of the product. All holes made in the timber after the pressure treatment, should also be treated this way.
- .3 Discard any chemical deposits, treated pieces of wood to which a finishing product will be applied.

2.4 INSTALLATION

- .1 Build cribs with CCA-treated wood with 254 mm x 254 mm, as shown in the plan.
- .2 The pre-assembly of wooden cribs will be done in the boats wintering site , located close to the launch facilities for boats.
- .3 Install square and plumb elements, depending on the prescribed heights, levels and alignments.
- .4 Before sinking the cribs, the Contractor must already have had half the quantity of stones required to fill them and the cribs must be completely filled in less than one week. The

Contractor shall provide and will have all the tools and equipment needed to keep the cribs in stable during immersion.

- .5 These cribs will be completely filled right to the lower limit of the joists with ballast stone, as described in sections 35 31 24 - Production of stone, as indicated in the plans. The stone must be filled in the cribs so as not to damage them, nor the base of the cribs.
- .6 The Contractor shall notify the Departmental Representative fifteen (15) days before the expected date of immersing the cribs and they will not be immersed unless the Departmental Representative gives a written approval.
- .7 If some cribs are not aligned after immersion, the Contractor shall remove ballast stone at his own expense until the cribs can come afloat, and he will put them in the right place.
- .8 Install the joists with their camber facing upward.
- .9 Carefully choose the structural elements that will be left exposed. Install the sawn lumber elements so as to disguise classification markings and deterioration, or remove by sanding the marks and traces of these exposed surfaces.
- .10 The construction and final assembly of the cribs as shown in the plans will continue once the cribs are placed in their final positions.
- .11 No permanent marks will be accepted or tolerated on the sections of the structure left exposed above level -2.0m (tidal level).
- .12 Assemble, anchor, attach, tie and brace the elements to make them strong and solid enough.

2.5 CLEANING

- .1 Clean all traces of temporary markings on the exposed sections of the structure.
- .2 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .4 Waste Management: separate waste materials for reuse, recycling or elimination in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

2.6 PROTECTION

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

END OF SECTION

Approved: 2010-12-31

Part 1 General

1.1 REFERENCES AND CODES

- .1 Unless otherwise specified, carry out painting work as manufacturer's instructions and according to actual specifications. Notice Department Representative of all contradiction between these instructions and specification.
- .2 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 Work 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 - ASME, American Society of Mechanical Engineers
 - .5 - ASM, American Society for Metals
 - .6 ASTM, American Society for Testing and Materials
 - .7 - AWWA, American Water Works Association
 - .8 - BNQ, Bureau de Normalisation du Québec
 - .9 - CNB, Code National du Bâtiment
 - .10 - CSST, Code de sécurité pour les travaux en construction
 - .11 - NACE, National Association of Corrosion Engineers
 - .12 - NFPA, National Fire Protection Association
 - .13 - ONGC, Office des Normes du Gouvernement Canadien
 - .14 - SSPC, Steel Structures Painting Council
 - .15 - ULC, Underwriters Laboratory of Canada

1.2 WORK DESCRIPTION

- .1 Actual section is related to paint works of sheet piles, repair plates, wheel guard, existing cleats and handgrips.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for paint and coating products and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .3 Samples:

- .1 Submit for review and acceptance of each unit.
- .2 Samples will be returned for inclusion into work.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements 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 Provide and maintain dry, temperature controlled, secure storage.
 - .2 Store painting materials and supplies away from heat generating devices.
 - .3 Store materials and equipment in well ventilated area within temperature as recommended by manufacturer.
 - .4 Comply with requirements relative to hazardous products, according to applicable rules.

1.5 SITE CONDITIONS

- .1 Temperature, Humidity and Substrate Moisture Content Levels:
 - .1 Apply paint finishes when ambient air and substrate temperatures at location of installation can be satisfactorily maintained during application and drying process, within paint manufacturer's prescribed limits.
 - .2 Apply paint to adequately prepared surfaces, when moisture content is below paint manufacturer's prescribed limits.
- .2 Additional application requirements:
 - .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.

Part 2 Products

2.1 MATERIALS

- .1 Two components epoxy, 85% solids content by volume, Interzone 954 type, designed for marine applications, according to standard ASTM D-523.
- .2 Colours:
 - .1 Wheel guard / hand grips / existing cleats: security yellow
 - .2 Wharf faces: black.

Part 3 Execution

3.1 GENERAL

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheets.

3.2 EXAMINATION

- .1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Departmental Representative damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.
- .2 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test". Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.

3.3 PREPARATION

- .1 Protection of in-place conditions:
 - .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore surfaces as directed by Departmental Representative.
 - .2 Protect factory finished products and equipment.
- .2 Surface Preparation:
 - .1 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
 - .2 Place signs in occupied areas as painting operations progress. Signs to approval of Departmental Representative.
- .3 Oxide removal
 - .1 When necessary, the rust layers should be removed with the appropriate hand or machine tools, without damaging the sound metal finish.
 - .2 The surfaces to be painted must be scraped by abrasive blasting according to standard SSPC-SP10
 - .3 The Contractor must use traps and separators between the compressor and the air ducts so that the compressed air be oil free and condensed water free.
 - .4 The cleaned surfaces must comply with the requirements described in the NACE, SSPC and BNQ standards concerning the cleanliness criteria.
 - .5 The profile created by the abrasive blasting cleaning should have a roughness of 75 to 100 microns. The worn-out abrasive should not be reused.
 - .6 The Contractor must make sure that the selected abrasive complies with the environmental laws and standards and he must make sure to recuperate the abrasive in order to avoid all pollution hazards.
 - .7 When cleaning the sheet piles surfaces, the Contractor should provide adequate and safe shelters depending of the products used and waste expected (waterproof shelter with an in and out exits dust and wind proof), shelters provided of an

immediate vacuum mechanism of residual dust/water, diluents , abrasives and other any residual polluted material, to be recuperated to avoid possible pollution.

.4 Final cleaning

- .1 After the abrasive blasting cleaning, the surface must be degreased in order to remove the dust and to dry it out before the paint application
- .2 Work site waste (solids or liquids) and soiled materials (Ex. empty cans, rags, masks, etc.) must be recover, store in a safe way (waterproof shelters, installed minimum 15 m away from water and away from traffic as well) and must be eliminated according to safety requirements.
- .3 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.
- .4 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances .
- .5 Touch up of shop primers with primer as specified.

.5 Application

- .1 The paint must be applied immediately after the final cleaning phase. None of the cleaned surface will be painted after a maximum 4-hour delay. If this delay is exceeded, the Contractor must start over the cleaning operation for the surface to be painted.
- .2 However, if during this period the surface to be painted has been contaminated or dampened, the Contractor is also required to clean the surface accordingly in order to comply with the above-mentioned clauses of these specifications.
- .3 In such an instance, the surface should be cleaned with a water jet and also dry-air blasted so that it is dried out perfectly.
- .4 Upon paint application, the Contractor should allow a minimum time of 30 minutes between the paint application and surface immersion in sea water upon flood tide.

.6 Paint preparation

- .1 Before starting the paint application, the Contractor must mix both components as follows:
 - .1 properly stir component A with a mechanical mixer according to the manufacturer's specifications;
 - .2 - mix the whole component A with the whole component B and stir with a mechanical mixer according to the paint manufacturer's specifications.
 - .3 - the mix preparation must be made just prior to the application, according to the manufacturer's specifications.

.7 .2 Surface condition before the paint application

- .1 The surface to be painted must be completely dry upon the paint application.

.8 Paint application

- .1 A coating of 10% diluted paint or according to the manufacturer's specifications, will be applied in all mechanical joints or discontinuities. These are the only cases where it is allowed to dilute the paint. Apply a minimum coating of 510 microns dried-up (610 microns wet) of the product with an "Airless" pump 30:1 (3000 psi) with a nozzle of 635 to 690 microns and a hose of 9,53 mm, Graco type or the equivalent.
- .2 It is strictly forbidden to dilute the paint upon this application.
- .3 A particular attention should be brought to the sheet piling joints in order to apply a sufficiently thick paint coating. The areas that cannot be painted with a pump must be painted with a paintbrush.
- .4 Contractor is specifically advised to take all required precaution to prevent any damages to environment.
- .5 Paint only after prepared surfaces have been accepted by Departmental Representative
- .6 Use method of application approved by Departmental Representative.
- .7 Conform to manufacturer's application recommendations.
- .8 Apply coats of paint in continuous film of uniform thickness.
- .9 Repaint thin spots or bare areas before next coat of paint is applied.
- .10 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

3.4 CLIMATIC CONDITIONS

- .1 Upon the paint application, the surface to be painted must be at least 3°C above the dewpoint, and the relative humidity should be lower than 85%. The paint application must be made when the surface temperature is higher than 10°C. The same conditions apply for the two components paint mixture preparation.
- .2 In the case climatic conditions change during the paint application, the works must be stopped immediately and the cleaned but non-painted surface must be prepared again so that it complies with the specifications before the paint application.

3.5 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 Place paint and primer defined as hazardous or toxic waste, including tubes and containers, in containers or areas designated for hazardous waste.

END OF SECTION

Approved: 2008-12-31

Part 1 General

1.1 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section [01 33 00- Submittal Procedures] .
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Provide two copies WHMIS MSDS - Material Safety Data Sheets
- .3 Shop drawings:
 - .1 Indicate equipment layout, mounting bolt locations, electric power requirements, sensing, wiring diagrams.
- .4 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria and installation sequence
- .5 Manufacturer's Field Reports: submit manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.

1.2 CLOSEOUT SUBMITTALS

- .1 Provide operation and maintenance data for parking control equipment maintenance for incorporation into manual specified in Section 01 78 00- Closeout Submittals .

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Packing, shipping, handling and unloading:
 - .1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements.

Part 2 Products

2.1 DESCRIPTION

- .1 Automatic gate operation, controlled by magnetic card reader and exit controlled by vehicle detection mechanism, such as :
 - .1 Access Pro L by Magnetic or approved equivalent;
 - .2 5m opening ;
 - .3 Magnetic field detection to avoid barrier closing on a vehicle;
 - .4 Barrier must provide power supply to card reader and equipped with a dry contact for opening.
 - .5 Color : orange;
- .2 Access control

- .1 Card reader shall be equipped with its own keypad, such as "Proxpro" with keypad by HID, or approved equivalent.
- .2 Card reader support shall be covered with non conductive plastic coating for use with magnetic reader.
- .3 Provide with a pack of 25 cards;

Part 3 Execution

3.1 INSTALLATION

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.
- .2 Install of parking control system to equipment manufacturer's instructions.
- .3 Test and adjust complete system for proper function and leave in perfect working order.
- .4 Cut grooves in road surface and install vehicle detection loops and lead-in-wires, to approved shop drawings.
- .5 Do not fill grooves until installation is approved by Departmental Representative , and tested for proper detection performance.
- .6 Supply of 115 VAC electrical power to terminal box in each parking equipment unit in accordance with Section 26 05 00- Common Work Results for Electrical .
- .7 Supply and install other electrical wiring, conduit junction boxes, transformers, circuit breakers and auxiliary components required for complete installation.
 - .1 Conform to CSA and local requirements.

3.2 FIELD QUALITY CONTROL

- .1 Manufacturer's Field Services:
 - .1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.3 CLEANING

- .1 Clean in accordance with Section 01 74 11- Cleaning.
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.

3.4 CLOSEOUT ACTIVITIES

- .1 Demonstration and Training: Conduct comprehensive demonstration for accommodation maintenance staff on operation and care of parking control system and provide with all relevant documentation and activated cards.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C117-04, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C136-05, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D422-63 2002, Standard Test Method for Particle-Size Analysis of Soils.
 - .4 ASTM D698-00ae1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft)
 - .5 ASTM D1557-02e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft)
 - .6 ASTM D4318-05, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.2-88, Sieves, Testing, Woven Wire, Metric.

1.2 DEFINITIONS

- .1 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.
- .2 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.
- .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 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.

1.3 ACTION/INFORMATIONAL SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Quality Control: in accordance with Section 01 45 00 - Quality Control.
- .3 Preconstruction Submittals:
 - .1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.
 - .2 Submit records of underground utility locates, indicating: location plan of existing utilities as found in field and a location plan of relocated and abandoned services, as required.
- .4 Samples
 - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Inform Departmental Representative at least four (4) weeks prior to beginning Work, of proposed source of fill materials and provide access for sampling.
 - .3 Submit 70 kg samples of type of fill and unshrinkable fill specified.
 - .4 Ship samples prepaid to Departmental Representative, in tightly closed containers to prevent contamination and exposure to elements.

1.4 QUALITY ASSURANCE

- .1 Do not use soil material until written report of soil test results is approved by Departmental Representative.
- .2 Health and Safety Requirements:
 - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.5 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 aggregate materials from landfill to local quarry or recycling facility for reuse.

Part 2 Material

2.1 MATERIAL FROM QUARRY

- .1 Clean stone
 - .1 Will consist of particles hard, resistant and exempt from clods of clay, from organic matters and from quite different harmful substance. It has to be resistance in the deterioration and in the destruction in conditions of frost thaw, of exhibition in the water and has to be of a quality which ensures the continuity of the structure in the weather conditions in which it must be used.
 - .2 Relative density: to ASTM C127, 2.65
 - .3 Quality of materials in compliance with NQ 2560-114

- .4 Size : clean stone 150 – 25 mm
 - .1 The size grading of the stone must be distributed as:
 - .1 D85 : 125 mm
 - .2 D50 : 75 mm
 - .3 D15 : 50 mm
- .5 Size : Clean stone 20mm
- .6 Size : 100-200 kg, well graded

2.2 RECOVERED MATERIAL

- .1 Material from excavation of wharf could be recovered for certain purposes in planned works :
 - .1 Excavated material superior to A contamination level could be used as backfill in new sheet piles wharf included between actual and planned sheet pile wharf, in area of B and C wharf face.
 - .2 Contaminated material can not be recovered for backfilling in wharf head, past of wall, nor in a 3m wide area west of wall separating 2 levels of wharf
- .2 Excavated material inferior to A contamination level could be used :
 - .1 As backfill for voids in wharf head ;
 - .2 In a 3m wide area west of wall separating 2 levels of wharf.
 - .3 As backfill as quarry run in breakwater.
- .3 Demolished concrete, excluding rebar, can be recovered as quarry run for use in new breakwater. Concrete shall be sorted and crushed in a size equivalent to what is mandatory for quarry run.

Part 3 Execution

3.1 PREPARATION/PROTECTION

- .1 Protect existing features in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and applicable local regulations.
- .2 Protect buried services that are required to remain undisturbed.

3.2 FILL TYPES

- .1 Use types of fill as indicated on drawings.
 - .1 Do not use backfill material which is frozen or contains ice, snow or debris.
 - .2 Place backfill material on a clean and no frozen surface, exempts from snow and ice
 - .3 Foundation and sub foundation material (MG-20 and MG-56) must comply with NQ-2560-114

3.3 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 Reinstall pavements [and sidewalks] disturbed by excavation to thickness, structure and elevation which existed before excavation.
- .3 Clean and reinstall areas affected by Work as directed by Departmental Representative.
- .4 Use temporary plating to support traffic loads over unshrinkable fill for initial 24 hours.
- .5 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM D4491-99a(2009), Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
 - .2 ASTM D4595-09, Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
 - .3 ASTM D4716-08, Standard Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
 - .4 ASTM D4751-04, Standard Test Method for Determining Apparent Opening Size of a Geotextile.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-4.2 No. 11.2-2004, Textile Test Methods - Bursting Strength - Ball Burst Test (Extension of September 1989).
 - .2 CAN/CGSB-148.1, Methods of Testing Geotextiles and Complete Geomembranes.
 - .1 No.2-M85, Methods of Testing Geosynthetics - Mass per Unit Area.
 - .2 No.3-M85, Methods of Testing Geosynthetics - Thickness of Geotextiles.
 - .3 No.6.1-93, Methods of Testing Geotextiles and Geomembranes - Bursting Strength of Geotextiles Under No Compressive Load.
 - .4 No.7.3-92, Methods of Testing Geotextiles and Geomembranes - Grab Tensile Test for Geotextiles.
 - .5 No. 10-94, Methods of Testing Geosynthetics - Geotextiles - Filtration Opening Size.
- .3 CSA Group
 - .1 CSA G40.20/G40.21-04(R2009) General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .4 Ministère des Transports du Québec - Tome IV – Norme 13101.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Provide manufacturer's instructions, printed product literature and data sheets for geotextiles and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Test and Evaluation Reports:

- .1 Submit copies of mill test data and certificate at least 4 weeks prior to start of Work.

Part 2 Products

2.1 MATERIAL

- .1 Geotextile: synthetic fibre fabric, supplied in rolls.
- .2 Properties:
 - .1 In compliance with 13101 standard of Tome VII by MTQ for a type III geotextile between two different material
 - .2 In compliance with 13101 standard of Tome VII by MTQ for a type V geotextile use with armor rock stones.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for geotextile material 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 Departmental Representative.

3.2 INSTALLATION

- .1 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.
- .2 Place geotextile material on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.
- .3 Overlap each successive strip of geotextile 600 mm over previously laid strip.
- .4 Pin successive strips of geotextile.
- .5 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material layers.
- .6 After installation, cover with overlying layer within 4 hours of placement.
- .7 Replace damaged or deteriorated geotextile to approval of Departmental Representative.

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.

3.4 PROTECTION

- .1 Vehicular traffic not permitted directly on geotextile.
- .2 Do not overload soil or aggregate covering on geotextile.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 05 50 00 – Metal fabrication
- .2 Section 06 05 73 – Wood treatment
- .3 Section 06 10 00 – Rough carpentry

1.2 RELATED ITEMS

- .1 This section is related to timber for wooden cribs, decking, construction and installation.

1.3 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 ASTM A-123, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .3 ASTM A153, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - .4 ASTM D1761, Standard Test Methods for Mechanical Fasteners in Wood.
 - .5 ASTM F1667, Driven Fasteners: Nails, Spikes, and Staples.
 - .6 ASTM F2329, Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners.
- .2 Canadian Standards Association (CSA International)
 - .1 CSA-G40.20/G40.21-04, 300/350W General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA-O80 Series-97(R2002), Wood Preservation.
- .3 Canadian Wood Council
 - .1 Wood Design Manual - 2005.
- .4 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber 2003 edition.
- .5 Conseil de l'industrie forestière du Québec (CIFQ)
- .6 Forest Stewardship Council (FSC)
 - .1 FSC-STD-01-001, FSC Principles and Criteria for Forest Stewardship.
 - .2 FSC-STD-20-002, Structure, content and local adaptation of Generic Forest Stewardship Standards
- .7 British Columbia Lumber Manufacturer's Association
 - .1 Standard Specifications for Construction Grade

- .8 Ministry of Forests, Lands and Natural Resource Operations of British Columbia.
- .9 Interim Process Specification for CCA Treatment of Coastal Douglas-fir Wood
- .10 It supplier's responsibility to comply to all codes and standards related to material and various component.
- .11 All wood must be treated according to BMP - Best Management Practices for the use of treated wood in aquatic and sensitive environments.

1.4 ACTION/INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
 - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Submit proposed placing method for ballast to Departmental Representative for approval, prior to placing of ballast

1.5 QUALITY ASSURANCE

- .1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.
- .2 Inspection and tests of saturated materials under pressure of a preservative will be conducted by a testing laboratory designated in accordance with CSA O80. Supply the documents of quality assurance immediately after first inspections and tests and all along the production to allow a continuous results verification by the Departmental Representative. At least, 7 days before each wood delivery, the contractor will supply a certification of compliance including the following information for each production lot:
 - 1. The species of the treated wood and its density (kg/m^3);
 - 2. The proportion faces of heart / faces of sapwood;
 - 3. The name and the member's number of the recognized classification organization;
 - 4. Identification of the processing plant;
 - 5. Type of preservation product;
 - 6. Treatment and sampling dates;
 - 7. The number of treatment production lot;
 - 8. The volume (m^3) of the treated wood production lot;
 - 9. The nominal size in mm and the quantity of parts in the production lot;
 - 10. The results of the retention test (kg/m^3) and the corresponding requirement of the CAN/CSA 080 Wood Preservation Standard;
 - 11. The results of the penetration test (%) and the corresponding requirement of the CAN/CSA 080 Wood Preservation Standard;
 - 12. Place of storing or expedition;
 - 13. A production lot of treatment represents to a given quantity of lumbers of same size and species, that have been treated at the same time, in same condition.
- .3 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .4 Worker protection:

- .1 Workers must wear Personal Protective Equipment when handling, drilling, sawing, cutting or sanding preservative treated wood and applying preservative materials.
- .2 Workers must not eat, drink or smoke while applying preservative material.
- .3 Clean up spills of preservative materials immediately with absorbent material. Safely discard of adsorbent material to sanitary landfill.

1.6 QUALITY CONTROL

- .1 If required, independent Inspection/Testing Agencies will be hired by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be covered by Departmental Representative. If non-compliance are noted, additional tests expenses are at the expense of the supplier further to the correction of the non-compliance,
- .2 Hiring of inspection/testing agencies does not release contractor's responsibility to provide with material and to take responsibility for quality insurance in accordance with Contract Documents.
- .3 Provide equipment required for executing inspection and testing by appointed agencies.
- .4 Allow inspection/testing agencies access to Supplier's facilities.
- .5 Co-operate to provide reasonable facilities for such access.
- .6 Remove defective works, whether result of poor workmanship, use of defective products or damage and including defect which are noticed during the implementation of materials, which have been rejected by Departmental Representative as not in compliance with the contractual documents. Replace or re-execute in accordance with Contract Documents.

1.7 WASTE MANAGEMENT

- .1 Separate waste materials for reuse, recycling or elimination 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 Ensure emptied containers are sealed and stored safely.
- .4 Do not dispose of preservative treated wood through incineration.
- .5 Do not dispose of preservative treated wood with other materials destined for recycling or reuse.
- .6 Dispose of treated wood, end pieces, wood scraps and sawdust at a sanitary landfill.

Part 2 Products

2.1 MATERIALS

- .1 Lumber of 254 X 254 mm:
 - .1 Species : among the following : Douglas -larch ; Hemlock- fir; SPF

- .2 Quality : No.1 according to the paragraph 130.B for the beams and stringer and 131.B for ports and square wood. However, all wood altered (soft rot) shall be rejected.
- .3 Timbers has to be cut square in both ends before processing, according to the article 748 b) of the Standard Grading Rules for Canadian Lumber.
- .4 Cutting tolerances for pre-cut wood required, prior to be treated, are 5 mm less and 10 mm in more.
- .5 All the parts must be rough wood;
- .6 The wood must be dried before the treatment.
- .7 Before the treatment with a product of conservation, dry materials until obtaining a degree of humidity not exceeding 25 %.
- .8 Incision have to be made on all pieces of wood for the treatment.
- .9 The product of conservation used for the treatment of the wood under pressure has to be in accordance with the standard CAN/CSA-080-M.
- .10 For Douglas, treatment process must be in compliance with *the Interim Process Specification for CCA Treatment of Coastal Douglas-fir Wood* of British Columbia, *Ministry of Forests, Lands and Natural Resource Operations*.
- .11 The coastal Douglas fir must meet the requirements of the NLGA 2000 titled "Standard Grading Rules for Canadian Lumber".
- .12 The coastal Douglas fir must meet the requirements of the British Columbia Lumber Manufacturers Association titled "Standard Specifications for Construction Grade".
- .2 Hardware
 - .1 ASTM A307 Heavy hex bolt, galvanized. Shank and threaded parts shall be of required diameter.
 - .2 Drift bolt : Rods according to G40.21 300 or 350 W or ASTM A572 44W or 50W, galvanized. Machine a 6.4 mm chamfer at one end.
 - .3 Steel washer G40.21 300W or 350W or ASTM A572 44W or 50W., galvanized . Dimensions : 10 mm thick ; 89 mm exterior diameter and 28.5 mm interior diameter. Squared shape washer are not allowed.
 - .4 Bolts and rods galvanizing: Hot dip galvanized to a 560 g/m² thickness, according to ASTM A153
 - .5 Galvanizing of rods and plates Hot dip galvanized to a 525 g/m² thickness, according to ASTM A123
- .3 Accessories
 - .1 Nails, spikes and staples: in compliance with ASTM F1667, Driven Fasteners: Nails, Spikes, and Staples.

2.2 STORAGE, HANDLING AND DELIVERY INSTRUCTIONS

- .1 Timbers have to be grouped by dimensions and attached solidly in bundle. Every bundle have to be delivered and covered with waterproof membrane (top, four

- sides, up to 2/3 height). Take the precautions so that the tarp material does not adhere to the wood.
- .2 Timber length must be indicated on each side of the bundle (top and four sides), directly on the tarp.
 - .3 Untreated wooden blocks must be supplied at unloading to support bundles and insure they will not be directly lie on the ground. Blocks will have to be for a maximum distance of 2400 mm, with 100x100mm (4''x4'') minimum size.
 - .4 Store the wood of work in horizontal position, equally supported and piled to allow the aeration when it is stored for long periods. Store timbers on a waterproof tarp.
 - .5 Timbers bundles must be sorted by length in the storage area (boats wintering park) positioned to insure that all timbers sizes are easily available to begin the prefabrication by the Contractor in charge of the works. The point must be coordinated with the Department Representative.
 - .6 When wood is handled, support the bundle in several places to prevent damage by flexion.
 - .7 Handle the work treated wood with slings or other approved transportation method by Department Representative, by avoiding damaging them, altering them or foul them and by following the instructions of the manufacturer, if necessary. Do not use sharp or sharp tools for the handling.
 - .8 The maximal height of bundles, from the ground, in the storing area (boats wintering park) will not exceed 3 bundles high or 4 meters. The same pile should not include different lengths.
 - .9 Replace without fees damaged products, to Departmental Representative requirements.
 - .10 Plan ahead delivery, unloading and storage in a way to ensure continuous supply to work site.

Part 3 Execution

3.1 PREPARATION

- .1 Determine the actual profile before and after dredging through bathymetric surveys.
- .2 Dredge area of crib base to bedrock.
- .3 Place and level crushed rock mattress in accordance with Section 31 36 19 - Gabion Mattresses.
- .4 Before construction, stockpile sufficient ballast to completely fill cribs.
- .5 Preparing the foundation:
 - .1 Prior to the construction of the cribs, the Contractor shall carry out a full bathymetric survey of the area where cribs will be placed. The frequency of data collection points must be 0.5 meters c/c in each of the transverse and longitudinal directions. The Contractor shall submit to the Departmental Representative the

prescribed survey and the changes in the conditions on the site. If bedrock is found at a level higher than the location of the crib bottom, refer to the plan for the way forward.

3.2 APPLICATION

- .1 Manufacturer's instructions: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

3.3 CRIB CONSTRUCTION

- .1 Precut and pre-bore timber prior to preservative treatment.
- .2 For the lag screws, bore guide holes with a diameter equivalent to 70% of the diameter of the stem of the lag. For drift pin, bore holes with the diameter of the type of hardware to be used, less than 1.0 mm than that of the latter. For mechanical bolts, bore holes with the same diameter as that of the bolts.
- .3 Construct timber cribwork to specified height prior to sinking in final position.
- .4 Ballast floor:
 - .1 Place ballast floor members on bottom timbers to their final position.
 - .2 Place ballast floor members horizontally.
 - .3 Secure pieces at intersections of bottom timbers and vertical posts, and other ballast floor members with drift pins.
- .5 Bottom timbers:
 - .1 Place the base members following the longitudinal direction so as to align with base of cribs.
 - .2 The length of base parts shall conform with the plans
 - .3 Vertically fasten the base parts to the cross members with drift pins at the location shown in the plans.
 - .4 Vertically attach the base parts to the second level of longitudinal members with bolts at location shown in the plans.
- .6 Longitudinal members
 - .1 Place longitudinal members to the centre of the joint piece of 1.2 m long.
 - .2 Attach all the longitudinal members to block pieces with bolts.
 - .3 Alternate beams joints such that the parts of two consecutive rows should not joint in the same cell or at the same post.
 - .4 At all levels, attach the longitudinal members to the cross ties using drift pin, and to the posts, using bolts as indicated in the plans.
 - .5 Attach the longitudinal members to cross ties with bolts as indicated in the plans.
 - .6 Ream the holes such that the bolt heads do not protrude over the front and lateral sides of each timber crib. Reaming holes is not required on the structures located within the cribs of the timber cribworks between level -2.0 m (tidal level) and the seabed.

- .7 Reaming holes is also required in some places to ease the proper installation of wooden parts.
- .7 Cross ties: the cross ties in the cribs must be installed in one piece.
 - .1 At all levels, attach the cross ties to the longitudinal members using drift pins, and to the posts, using bolts as indicated in the plans.
 - .2 Attach the cross ties to the beams with carriage bolts as indicated in the plans.
- .8 Post: the post must be installed in one piece, from the bottom of the crib to the top and their lengths should be adjusted once the cribs are built to their final level.
- .9 The posts must be covered with a membrane piece folded 10mm on sides.

3.4 HANDLING TREATED TIMBER

- .1 Handle treated material without damaging original treatment.
 - .1 Replace treated timber with major damage to original treatment, as instructed by Departmental Representative.
- .2 Field treatment: apply and saturate cuts, minor surface damage, abrasions, and nail and spike holes with preservative to CAN/CSA-O80 Series.

3.5 TOLERANCES

- .1 The accepted tolerance, as far as the overall dimensions of a crib are concerned, shall be 50 mm.
- .2 The allowed deviation from the specified location is at most 50 mm.
- .3 The exterior frontage of all wooden cribs must be aligned to one and the same plan. The difference between one side of a crib in relation to the adjacent side of the other crib shall not exceed 15 mm.
- .4 The vertical alignment of the exterior frontage of the cribs shall not exceed 5 mm by 1000 mm.
- .5 The differential between the two verticals of a crib and the next one shall not exceed 15mm.

3.6 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

1.1 REFERENCE STANDARDS

- .1 ASTM International (ASTM)
 - .1 ASTM A6/A6M-11 , Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling.
 - .2 ASTM A615/A615M-09b , Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
 - .3 ASTM A1011/A1011M-10 , Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, and Ultra High Strength.
 - .4 ASTM A328/A328M-07 , Standard Specification for Steel Sheet Piling.
- .2 CSA Group (CSA)
 - .1 CSA G40.20/G40.21-04(R2009) , General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA W47.1-09 , Certification of Companies for Fusion Welding of Steel Structures.
 - .3 CSA W59-03(R2008) , Welded Steel Construction (Metal Arc Welding).

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for Piles and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Québec.
- .4 Certificates:
 - .1 Submit 2 weeks prior to fabrication, 2 copies of steel producer certificates in accordance with ASTM A1011/A1011M , and mill test reports in accordance with CSA G40.20/G40.21 .

1.3 QUALITY ASSURANCE

- .1 Inspection and testing of steel sheet piling material will be carried out by testing laboratory designated by contractor at any time during course of Work.
- .2 Materials inspected which fail to meet contract requirements will be rejected.
- .3 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, Contractor to pay costs for additional tests or inspections Departmental Representative to approve corrected work.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store and protect sheet piles from nicks, scratches, and blemishes.
 - .2 Replace defective or damaged materials with new.
- .4 Use slings for lifting piling make sure mass is evenly distributed and piling is not subjected to excessive bending stresses.
- .5 Store sheet piling on level ground or provide supports so that sheet piling is level when stored.
 - .1 Provide blocking at spacing not exceeding 3 m so that there is no excessive sagging in piling.
 - .2 Overhang at ends not to exceed 1.5m.
 - .3 Block between lifts directly above blocking in lower lift.
- .6 If material is stock-piled on structure, ensure structure is not overloaded.

Part 2 Products

2.1 MATERIALS

- .1 Steel sheet piles: to ASTM A572 Gr 50.
- .2 Continuous interlocking Z section:
 - .1 Type 1 sheet pile :
 - .1 Minimum effective section modulus: 3795 cm³ /m
 - .2 Minimum flange thickness: 12mm
 - .3 Minimum web thickness: 16mm
 - .2 Type 2 sheet pile :
 - .1 Minimum effective section modulus: 1870 cm³ /m
 - .2 Minimum flange thickness: 9mm
 - .3 Minimum web thickness: 9mm
 - .3 Sheet pile pair width shall be 1400mm. If another width is chosen, design and drafting revision shall be at contractor's own expenses.
- .3 Structural steel for wales, bearing plates, wales splices, capping channels, support angles and miscellaneous steel: to CSA G40.21, Grade 350 W.
- .4 Tie rods, sleeve nuts and turnbuckles:
 - .1 Tie rods: to ASTM A615 , Grade 150ksi
 - .2 Tie rods: to continuously threaded bar ..
 - .3 Sleeve nuts,: to have load capacity in excess of capacity of tie rod.

- .5 Nuts and bolts: hexagon nuts, bolts, and washers: to ASTM A325, nuts ASTM A562 and washer to ASTM A436.
- .6 All hardware (walers, tie rods; bolts; nuts; washer; pipes; plates; splicing plates; sleeve) will be galvanized.
- .7 Contractor shall provide with his method before box pile driving to refusal and installation of rock anchors. This will include minimally :
 - .1 Driving energy calculation depending on chosen equipment. Maximum energy to CCDG criteria.
 - .2 Refusal criteria to obtain suitable waterproofness before concrete installation;
 - .3 Drilling method and confirmation of required depth obtained;
 - .4 Concrete installation method including control method for elevation shown on plan.
 - .5 Backfilling sequence depending installation of various wharf face components.
 - .6 Method shall be signed by an engineer with experience in pile driving and anchors installation.

2.2 SOURCE QUALITY CONTROL: HOT ROLLED SHEET STEEL PILING

- .1 Provide results of tests of sheet piling material to be used on project as follows:
 - .1 One tension test and 1 bend test from each heat for quantities of finished material less than 50 tonnes.
 - .2 Two tension tests and 2 bend tests from each heat for quantities of finished material exceeding 50 tonnes.
- .2 Tension tests in accordance with CSA G40.20/G40.21.
 - .1 Bend tests: to ASTM A6/A6M.
- .3 Interlock compatibility test : use 3 (three) m long connection profile that will be slid in all interlock to ensure compatibility.
- .4 Check sheet pile straightness following criteria of applying codes.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for steel sheet piles 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 Departmental Representative.

3.2 INSTALLATION

- .1 Do welding in accordance with CSA W59.
- .2 Do not begin pile installation until required quality control tests have been completed and test results approved by Departmental Representative.

- .3 Submit full details of method and sequence of installation of piling to Departmental Representative for approval prior to start of pile installation work. Details must include templates, bracing, setting and driving sequence and number of piles in panels for driving.
- .4 When installing sheet piles in bulkhead wall, use procedure as follows:
 - .1 Provide temporary templates or bracing to hold piles in alignment during setting and driving.

- .2 Drive piles two at a time. Drive first double pile to full depth, then place panel of five to eight double sheet piles in templates and secure last (end) double pile in location to prevent spreading of piles in panel.
- .3 Drive end double pile in panel sufficiently deep into ground to ensure that it will remain plumb, then, drive remaining double piles in panel to full depth beginning with double pile next to end double pile and finishing with double pile next to double pile first driven.
- .4 After one panel has been driven, place and drive succeeding panels in similar manner. Complete driving of end double pile of first panel after double piles of second panel have been driven.
- .5 When installation is complete, face of wall at top of sheet piles to be within 75 mm of location as indicated and deviation from vertical not to exceed 1 in 100.
- .6 Cut drain holes [and install steel pipe elbows] as indicated. Include filter material in area of drain holes as indicated.

3.3 OBSTRUCTIONS

- .1 Consult geotechnical study where it is mentioned that some boreholes hit debris that caused refusal. It is possible that cleaning has to be done in driving lane. If it is required to excavate material, management of those shall comply with applying regulation.
- .2 If obstruction encountered during driving, leave obstructed pile and proceed to drive remaining piles. Return and attempt to complete driving of obstructed pile later. Remove pile and excavate as needed.

3.4 HOLES

- .1 Patch holes in sheet pile wall, except where permanent holes are indicated.
 - .1 Use plates of equivalent thickness to sheet pile.
 - .2 Weld to develop full strength of plate.

3.5 CUTTING

- .1 When flame cutting tops of piles, and flame cutting holes in piles approved by Departmental Representative, use following procedure:
 - .1 When air temperature is above 0 degrees C, no pre-heat is necessary.
 - .2 When air temperature is below 0 degrees C, pre-heat until steel 25 mm on each side of line of cut has reached a temperature very warm to hand (approximately 35 degrees C). Temperature indicating crayon marks may be used to measure temperature.
 - .3 Use torch guiding device to ensure smooth round holes or straight edges.
 - .4 Make cut smooth and free from notches throughout thickness. If grinding is employed to remove notch or crack, finished radius to be minimum 5 mm.

3.6 SPLICING

- .1 Use full length piles unless splicing is approved on site by Departmental Representative. .

3.7 TIE ROD ANCHORAGE SYSTEM

- .1 Do not place backfill behind anchored bulkhead or remove material from in front of bulkhead until piles have been completely driven, adjusted and secured in final position by anchorage system and until concrete of rock anchor has a resistance of 70% of final.
- .2 Support tie rods at intervals along their length as indicated.
- .3 Fit and adjust tie rod systems so that connections at waling and anchor end of tie rods are tight before backfilling.
- .4 Brace steel sheet pile with waling strips in accordance with shop drawings. Make wales one length between corners and bolt to piles.

3.8 BACKFILLING

- .1 Backfill in accordance with Section 31 23 33.01- Excavating, Trenching and Backfilling and as indicated.
- .2 Protect piling tie rods and anchorage systems from damage or displacement during backfilling operations.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 11 00 – Work related general information
- .2 Section 01 33 00 – Submittal procedure..

1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM D698-[00a], Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
- .2 Government of Québec, Minister of Transport
 - .1 Cahier des charges et devis généraux (CCDG).

1.3 SAMPLES

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to Departmental Representative, samples of material for sieve analysis at least 4 weeks before beginning Work.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 11 - Cleaning

Part 2 Products

2.1 MATERIALS

- .1 Aggregates: to CCDG.
 - .1 Crushed Granular MG 20.
- .2 Prime coat: to CCDG.
- .3 Asphalt concrete ESG14 with asphalt cement PG 58-34 to CCDG according to roadway laboratory method.

Part 3 Execution

3.1 PAVEMENT CONSTRUCTION

- .1 Surface preparation: CCDG.
- .2 Application of prime coat: CCDG.
- .3 Construction of asphalt concrete: CCDG.

CARLETON SUR MER
Reconstruction of wharf
Project : 721198

Section 32 12 16.01
ASPHALT PAVING - SHORT FORM
Page 2

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Justice Canada: Canada Shipping Act - Collision Regulations (C.R.C., c.1416).

1.2 DEFINITIONS

- .1 **Debris:** pieces of wood, wire rope, scrap steel, pieces of concrete and other waste materials.
- .2 **Grade:** plane above which material is to be dredged.
- .3 **Class 1 material:** bedrock which can only be excavated with a heavy duty service excavator, as well as rocks and fragments of at least 1.5 m³ in diameter.
- .4 **Class 2 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 m³.
- .5 **Debris:** materials other than class 2 materials, with a diameter of 1.5 m³ or more.
- .6 **Measurements:**
- .1 CPM: cubic metres place measurement at excavation site.
- .10 **Lowest Normal Tide (LNT):** plane so low that tide will seldom fall below it.
- .11 **Side slope:** inclined surface or plane from subgrade at side limit of excavation area to intersect original ground line outside of side limit and to be expressed as ratio of horizontal to vertical.
- .12 **Estimated quantity**
- .1 Unless otherwise indicated, it is the volume of materials located above the required depth and within the excavation area, and is expressed in cubic meters.
- .15 **Chart datum:** the reference level, the low water level in tidal waters, defined by the Canadian Hydrographic Service and from which the samplings or tides level are established.
- .16 **Cleared Area:** excavation area accepted as complying with plans and specifications.

1.3 CHART DATUM, DEPTHS AND TIDAL BENCHMARKS

- .1 The depths and elevation used in these specifications and contract drawings are given in meters in relation to the chart datum.
- .2 All the areas to be dredged must be defined, following the indications, with the vertical tidal benchmarks.

1.4 REGULATORY REQUIREMENTS

- .1 Comply with the codes and municipal, provincial and national regulations concerning this project.
- .2 Mark out floating equipment using navigation lights in accordance with the Collision Regulations and Notices to Mariners.

1.5 IMPLEMENTATION CONDITIONS

- .1 Before submitting their bid, the Contractor shall obtain all the necessary information concerning the nature and scope of the work and all the conditions that can influence the execution of such work.
- .2 The results of the most recent known surveys and drilling are included in the contract drawings. The data may differ with the current conditions in the area.

1.6 CHARACTERISTICS OF MATERIAL TO BE EXCAVATED

- .1 The Department has commissioned a firm to carry out environmental checks of material and no contamination was found in boreholes done.
- .2 Departmental Representative will carry out a follow up during works. In case of doubt, laboratory analysis will be done and soil management will be according to applying regulation. In these conditions, section 01 35 43 – Environmental protection will apply.

1.7 SPECIFIC MEASURES

- .1 The Contractor shall pile up material inside a basin so that materials from the area are physically separated from algae. The material stockpiles should be identified at the site through posters, signs or any other means that enables rapid and accurate identification.
- .2 The Contractor shall pile up the material inside a basin so that the dredged materials can dry up before they are transported out of the site.
- .3 The Contractor shall cover material stockpile inside the watertight basin in the following situations:
 - .1 Unfavourable weather conditions (rain, snow, ice, etc.).
 - .2 Weather conditions that contribute in dispersing sediments (strong winds, storms etc.).
 - .3 The absence of activity on the construction site (evenings, weekends, holidays etc.).
- .4 The Contractor shall ensure that the water flowing from the piled excavated material inside the basin is channelled to a sediment collection device (bales of hay, geotextiles or any other means deemed acceptable by the Departmental Representative).
 - .1 The Contractor shall ensure the proper functioning of the sediment collection device throughout the project.
 - .2 The water flowing from the unsealed basin must be free of sediments or fine particles.
- .5 The Contractor shall remove piled excavated material from the unsealed basin only when their water content is low enough to allow transportation without water or mud flowing from the trucks bin.
- .6 The Contractor shall demolish the basin when all the material would have been removed from the site. Geotextiles, clear stone, sediment collection device and all materials used in the construction of the unsealed basin will then be managed following the regulations in force.

1.8 SEQUENCE

- .1 Provide the Departmental Representative with an excavation schedule, as well as the stages.
- .2 The Departmental Representative could then request the Contractor to change the sequence of the areas to be dredged.

1.9 EQUIPMENT

- .1 The equipment that will be used for the works should be adequate and in good working condition in order to obtain satisfactory results following the schedule specifications.

Part 2 Products

2.1 EXCAVATION EQUIPMENT

- .1 Determine required material to excavate and dispose specified material

Part 3 Execution

3.1 GENERAL

- .1 Before work begins, the Contractor shall have received a written approval from the Departmental Representative with regard to their deadlines
- .2 Excavation with a long stick from wharf is preferred, but it could be accepted to build a temporary jetty from landing ramp. This jetty shall be built with material that are free of fine particles and be completely removed at end of works. Contractor shall provide with his work method for review by departmental Representative.
- .3 Mitigation measures for works in water shall apply for actual activity.
- .4 Excavation will be done following the limits indicated in the plan.
During the period of work, cover the entire area above the excavation level as shown in the plan.
- .5 The Contractor shall comply with the excavation level, which will be shown to him by the Departmental Representative so as to minimize excavation outside the indicated limits. Any excavation that exceeds the designated area shall be the sole responsibility of the Contractor and carried out at his own expense.
- .6 The Contractor shall dredge with the help of a computer system that is able to properly display on a monitor, the level, the relevant bathymetric data from the work (locations and thickness of materials) as well as the template.
- .7 The coordinates of the relevant points to determine the horizontal limits of areas will be provided by the Departmental Representative.
- .8 The Departmental Representative may verify, at his convenience, the accuracy of the positioning systems used by the Contractor.

- .9 All the main intermediary of secondary points (X, Y), (X, Y, Z) and (lat., long.), used by Contractor, determined by himself or provided to him by the Departmental Representative or by someone else, will be under their full responsibility.
- .10 In the course of the contract, all machines must be in good working condition and instantly repaired at all times.
- .11 Demobilization: The Contractor may withdraw his equipment only after receiving permission from the Departmental Representative. Such will only be possible after the final job is considered acceptable.
- .12 Buoys necessary for the contract: The Contractor must, at his own expense, provide, install (wet), and maintain all the buoys or marks required to effectively carry out the contract. If, by chance or by accident, one or more buoys/marks got stuck or went adrift, they would be bailed out and/or recovered at the expense of the Contractor to the satisfaction of the Departmental Representative. The Contractor shall be responsible for any accident caused as a result of poor visibility or position of buoys/marks in the day to their poor lighting at night, or for any other reason.
- .13 Ensure that all signals and lights remain functional and are compulsorily installed on the equipment used for the work, according to the "Collision Regulations" and the "Safety Regulations in Navigation" on the St. Laurent River. All the equipment needed for work must therefore be properly identified and/or visible at all times.
- .14 Subject to the authorization of the Departmental Representative, no discharge of material will be allowed outside of the land disposal site. The Contractor shall be responsible, when the need arises, for the consequences of not respecting the location for the disposal of materials.
- .15 The Contractor shall fill a daily log sheet on their activities. The forms will be provided by the Departmental Representative before work begins.
- .16 Carry out the work such that no damage is caused to fishing vessels and minimize interference with fishing operations in executing operations within the identified areas.
- .17 The Contractor shall be held responsible for any damages if they result from works. If damage occurs, take responsibility for the costs of repair or replacement as well as those linked to the loss of fishing opportunities.
- .18 All equipment used must be able to withstand the sea and be in good condition.
- .19 If in the course of the project, the equipment supplied is not suitable enough to perform the task satisfactorily, based on the judgement of the Departmental Representative, or the Contractor is delayed, the Contractor shall, within fifteen (15) days after receiving a written notice from the Departmental Representative on the issue, provide additional equipment that must first be approved by the Departmental Representative.
- .20 Install and maintain tide gauges and water level indicators in order to determine the appropriate depth. Place the gauges or water level indicators such that they are clearly visible.
- .21 Remove material accumulation resulting from the work at no additional cost to the Crown.

- .22 Remove materials which were transported outside excavation area, as if they were material and evacuate them. Unless the Departmental Representative authorizes it, it is not possible to deposit materials around the area of work.
- .23 Inform the Departmental Representative as soon as you find an object, including boulder or bedrock, which can be classified as debris or obstruction. Bypass the object after clearly marking out the site with buoys manufactured before work begins, inform the Departmental Representative of the MTM coordinates and then continue work.
- .24 Take the necessary measures to protect the existing structures located around the area of work. If necessary, any damage caused by the project shall be repaired at the expense of the Contractor.
- .25 Activities at the wharf shall always be given priority over excavating and unloading.
- .26 Operations shall be coordinated alongside other activities at the wharf.
- .27 The area must be kept clean throughout the project.
- .28 No dock activities (unloading, transfer, transportation, handling, etc.) or temporary adjustment can be carried out (or implemented) if there is the likelihood of interference with the users. There should be coordination for these activities to be carried out.

3.2 SURVEYS AND ACCEPTANCE OF WORK

- .1 A bathymetric survey will be conducted by Contractor before works begin;
- .2 The survey after works will be done by the Contractor. The survey will be conducted using electronic survey equipment operating in snapshot mode. The survey plan "average instant surveys" conducted at a scale of 1:500 will define the elevation of the foundation in the areas studied. The grid will be 0.5m X 0.5m. The Contractor shall prove that he has reached the levels shown on the plans before the installation of the cribs. This survey must be accepted by the Departmental Representative.
- .3 The Contractor shall submit a formal request, at least five (5) business days in advance so that the after survey can be carried out.
- .4 During bathymetric surveys after works r, department Representative may be present with the team in charge of the survey.
- .5 The Contractor shall provide with the results of the survey later works within four (4) business days after the survey.
- .6 If required, Department representative will carry out verification survey.
- .7 If, after verification surveys, or the following, there were materials above the prescribed level, or if there are missing materials in the foundation, the Contractor shall return, at his own expense, to the site to complete the work to the satisfaction of the Departmental Representative.
- .8 Subsequent surveys and inspections required after such remedial work shall be charged to the Contractor following the aforementioned rates.
- .9 The final amount payable shall be calculated according to the surveys conducted, by Departmental Representative, before or after works.
- .10 For the work acceptance, general cleaning of the premises concerned must be done and the location vacated to the satisfaction of the Departmental Representative.

3.3 LIMITS OF WORK AREA

- .1 At beginning of work onsite, immediately locate the reference points and take adequate measures to avoid moving these points.
- .2 The Departmental Representative will meet with the Contractor and the surveying staff to determine the horizontal reference parameters established. Coordinate system with geodetic points and determine the vertical reference parameters to define the work and area as well as the tide marks.
- .3 Keep the set horizontal and vertical reference parameters and mark the work area according to these established references. Take responsibility for the accuracy of the work from established references. Supply, install and provide maintenance of the direction-finding and telemetry equipment used to ensure effective control of operations. Provide a survey vessel, equipment and crew needed, and the costs so as to better identify the limits of excavation area and monitor them.
- .4 The electronic positioning system of the Contractor should be accessible to the Departmental Representative, or his representative, on request. It should automatically update the position continuously in all weather conditions. The minimum position accuracy must be ± 1 m. A graphical display function of the position on-line and hard copy is required. The positioning system must be approved by the Departmental Representative.
- .5 Establish a tidal gauge or scale, and keep it in good condition, to determine the appropriate excavation depth. Place the gauge or scale so that it is clearly visible.
- .6 Establish and keep in good condition temporary sea-marks, benchmarks and additional buoys to locate and correctly define excavation areas designated as required. Remove these items once the work is completed.
- .7 .7 Install buoys, tidal benchmarks and navigational lights, and keep them in good condition, in order to define work areas.

3.4 TRAVAUX D'EXCAVATION

- .1 Map out the work area according to the tide marks and established work limit. Take responsibility for the accuracy of the work compared to tidal marks. Supply, install and provide maintenance for the direction-finding and telemetry equipment, laser theodolites and any other piece of equipment usually used to ensure effective control of excavation operations.
- .2 All the areas to be excavated must be defined, following the indications, with the vertical tidal benchmarks.
- .3 Excavate the area to the corresponding level of depth required.
- .4 Excavate the slopes according to information provided.
- .5 Remove the materials that are above the prescribed depth within the specified limits. Material located below the bottom layer or outside the area or the prescribed lateral slope is not included in this contract.
- .6 Eliminate, at no cost for the Departmental Representative, all high spots caused by an accumulation of materials during the execution of works.

- .7 Remove transported material outside of work area and also remove the dredged material. Do not allow material loss outside area of work.
- .8 Remove materials from the work areas, before the reception of the area by the Departmental Representative.
- .9 Immediately notify the Departmental Representative of the discovery of any object which may be classified as clutter. Bypass the object after clearly marking it and continue work.

3.5 DISPOSAL OF MATERIAL

- .1 Dispose of materials according to applicable regulations.
- .2 Evacuate material to an authorized treatment site.
- .3 Depending on water content, dump truck bins must be sealed to prevent spillage of materials during transportation. Clean up spills as indicated and take the necessary measures to prevent further occurrence.
- .4 Do not allow materials to spill or flow into the river during its.
- .5 Keep pavements and the transfer area clean throughout the contract. Repair the damages caused by the activities of the Contractor, at no extra cost. Leave the surfaces in their original state at the end of the work.

3.6 REMEDIAL

- .1 Carry out excavation remedial work in the areas that do not meet the requirements and check the depths reached by sweeping or additional surveys, to the satisfaction of the Departmental Representative.

3.7 QUALITY CONTROL

- .1 Testing and on-site inspections
 - .1 Cooperate with the Departmental Representative during the work inspection and provide any assistance requested.
 - .2 At the request of the Departmental Representative, provide boats, equipment, labour and usually used materials, and considered necessary to perform carry out inspection and supervision.
 - .3 Provide adequate boat services to transport the Departmental Representative.
 - .1 At the beginning and end of inspection shifts that take place between sunset and sunrise.
 - .2 When weather conditions are bad and in emergency situations affecting the health and safety of personnel.
- .2 Faulty works
 - .1 If as a result of incomplete work, additional verification of depth levels at random or by scanning the beam is deemed necessary, extra costs will be incurred.
 - .2 Carry out remedial work in the areas that do not meet the requirements and check the depths reached by sweeping or additional surveys, to the satisfaction of the Departmental Representative.

CARLETON SUR MER
Reconstruction of wharf
Project : 721198

Section 35 20 23
EXCAVATION NEAR RAMP
Page 8 of 8

END OF SECTION

Part 1 General

1.1 SCOPE

- .1 This section treats the production of stone for the extension of rock filling and the stone ballast in the wooden, including the process of acceptance of stone sources by the Departmental Representative, and quality assurance checks that apply. The Contractor is responsible for quality control (QC), while the Departmental Representative is responsible for quality assurance (QA).

1.2 RELATED SECTIONS

- .1 Section 35 31 25 –Placement of stone

1.3 REFERENCES

- .1 The latest editions of the standards and publications listed below form a part of this specification to the extent referenced.
- .2 American Society for Testing and Materials (ASTM)
 - .1 ASTM C88-05 : Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
 - .2 ASTM C127-07 : Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate
 - .3 ASTM C136-06 : Sieve Analysis of Fine and Coarse Aggregates
 - .4 ASTM C295-03 : Petrographic Examination of Aggregates for Concrete
 - .5 ASTM D4992-07 : Evaluation of Rock to be Used for Erosion Control
 - .6 ASTM D6928-06 : Standard Test Method for Resistance of Coarse Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus
 - .7 ASTM D7012-07 : Standard Test Method for Compressive Strength and Elastic Moduli of Intact Rock Core Specimens under Varying States of Stress and Temperatures.

1.4 MEASUREMENT AND PAYMENT

- .1 Measure
 - .1 All the stones shall be measured for the payment in the metric tons (1,000 kg) for materials accepted for the implementation in the work according to the weighing tickets of the certified scale as described below.
 - .1 The Contractor has to proceed to the installation and the certification of an electronic balance before the transport of stone. The balance has to be of type (chap) register and has to be of a capacity to weigh the stone and the means of transportation. The dimensions (size) of the balance have to allow to receive all the wheels of means of transportation used by the Contractor.
 - .2 The Contractor shall provide the departmental representative of the copies of the tickets of all stones delivered on-site weight every day.

1.5 SUBMITTALS

.1 The following information shall be submitted to the Departmental Representative accordingly to Section 01 33 00 – Submittal procedures.

.1 Stone source information:

1. Within 15 working days of notice of acceptance of offer, the Contractor shall submit the following information for all proposed stone sources for each stone size classification:

- .1 Name and location of quarry;
- .2 Areas and lifts of the quarry to be worked;
- .3 Specific geological stratum or strata to be used;
- .4 Laboratory test records and results (refer to requirements in Table 1) representation of areas and lifts to be worked for this project;
- .5 List of completed marine projects constructed using the same stone to be furnished for this project.

.2 Gradation tests

1. Submit all gradation tests for review, complete with gradation test data sheets, calculations and graphical presentation of results.

.3 Installation and certification of weigh scale

1. The Contractor shall make arrangements for the installation and certification of an electronic weigh scale at the work site before shipping the stones as indicated in 1.4.1.1. Weigh scale installation and certification are provided at Contractor's expense.
2. At least 5 working days before loading, submit the details concerning the location and the type of weigh scale installed for the purpose of the project as well as a document certifying the accuracy of the scale(s) under Industry Canada.

.4 Weigh scale operators

1. The Contractor shall provide weigh scale operators and pay all costs involved.

.5 Other weighing devices

1. Submit the details of the equipment incorporating load cells or other devices to weigh stones individually. These devices are provided at Contractor's expense.

.6 Certified weight scale tickets

1. A copy of each weight scale tickets, including certification of exact weight, time of weighing and of delivery shall be submitted to the Departmental Representative the day following the weigh-in.

1.6 TERMINOLOGY

The following definitions shall pertain to these terms :

- .1 Dimensional ratio (l/d) – report between the length (l) and the thickness (d) measured on three axes mutually perpendicular. The length of the stone (l) is the most long distance between two points on the stone (between two opposite

corners). The thickness of the stone (d) is the minimal dimension of two opposite faces of the stone.

- .2 The word “ton” (t) refers to the metric ton (1 t = 1 000 kg).

1.7 QUALITY CONTROL

- .1 The SMC Plan shall be incorporated into the Contractor’s overall Quality Control Program (QCP) in accordance with Section 01 45 00.

1.8 QUALITY CONTROL STAFFING

- .1 General

- .1 The Contractor shall provide a qualified full-time Stone Materials Control (SMC) Field Supervisor, and appropriate stone source and loading facility inspector(s). In addition, the Contractor shall retain the services of a Licensed Professional Geologist to assist the SMC Field Supervisor on an “as required” basis throughout the duration of the Work. The SMC staff shall verify that all stone produced, delivered to the Project site, and placed in the Works conforms to the requirements of the Contract Drawings and Specifications.

- .2 Supervisor’s qualifications and duties

- .1 The supervisor is responsible for implementing all the elements in the control plan for stones. He has at least 2 years of specialised experience in the inspection and assessment of armour stone for marine projects. The experience must have been acquired in the quality assessment of the type and size of stone involved in the project at hand. Where the Contractor obtains the stones for this project from a subcontractor, the supervisor shall not be an employee of the latter.
- .2 The supervisor shall be responsible for the implementation and fulfilment of the control plan for stones, including the management, control and assessment of the work performed by all the inspectors. He shall provide qualified inspection personnel at all times and replace any person whose performance is unsatisfactory. The supervisor is responsible for the quality of all stone produced.

- .3 Qualifications and Duties of Geologist

- .1 The Geologist shall be a Licensed Professional Geologist, with at least one year of practical experience in armour stone inspection and assessment. The Geologist shall provide assistance to the SMC Field Supervisor during stone source selection, including the completion of visual and petrographic examinations (refer to Table 1), identification of specific areas and lifts of acceptable and unacceptable stone at the source(s) and the selection of Pre-Production Reference Stones. In addition, the Geologist shall be retained during stone production if ongoing Quality Control (QC) or Quality Assurance (QA) activities indicate that the quality of stone being furnished is not as specified or is questionable, as directed by the Departmental Representative.

- .4 Qualifications and Duties of Inspectors

- .1 The SMC inspectors shall be persons with sufficient training and a minimum of one year of relevant experience to competently and independently perform the tasks itemized below while under the general supervision of the SMC Field Supervisor.

- .1 Participate in the selection of stone for the Pre-Production Reference Stones and in the evaluation of stone placed in the stockpiles.
- .2 Maintain a clear, legible daily log of activities and observations in a format to be approved by the Departmental representative. Prepare daily inspection reports and submit in a timely manner.
- .3 Visually inspect every Armour stone to verify that the stone meets the quality requirements of this Section. The examination shall focus on stone quality, fractures, stone geology and other detrimental features that may cause the stone to deteriorate into smaller pieces after it is in place in the Work.
- .4 Measure one representative sample along three mutually perpendicular axes and estimate its weight, based on the unit weight of that stone type, and its aspect ratio.
- .5 Proceed to regular checks of estimated weights against the scaled weights using a weight measurement method approved by the Departmental Representative.
- .6 Build and maintain separate stockpiles for each category of stone.
- .7 Ensure that rejected stones are stockpiled in the “reject” pile or that they are removed without delay from the site after being marked. Rejected stones shall always be segregated from accepted stones.
- .8 Perform periodic checks that load cells or other equipment-mounted weight scale devices are accurately weighing stone for quality control.

1.9 ACCEPTANCE DETERMINATION FOR STONE SOURCE(S)

- .1 The Departmental Representative reserves the right to undertake independent investigations and evaluations as necessary to verify whether or not materials meeting the requirements of these specifications can be produced from the proposed source(s), including the stone quality tests listed in Table 1. Any additional testing shall be undertaken on stone samples selected by the Departmental Representative. All costs associated with independent investigations and evaluations of the originally proposed stone source(s) shall be the responsibility of the Departmental Representative.
- .2 The Departmental Representative will make an acceptance determination for the Contractor’s proposed stone source(s) and SMC Plan, including SMC staff, based on the following information:
 - .1 Review of the Contractor’s Stone Source Information
 - .2 Visual inspection of stones
 - .3 Assessment of this information relative to the specified requirements for stone quality and stone gradation and shape;
 - .4 Review of results of additional laboratory testing.
- .3 The Departmental Representative will provide a determination of acceptance or rejection of the stone source(s) and staff proposed by the Contractor within 10 working days of the date of Departmental Representative inspection or receipt of additional laboratory test results
 - .1 If the stone source, SMC Plan and SMC staff are determined to be acceptable, the Contractor may then proceed with the production of materials for this Contract.

- .2 If the stone source(s) is rejected, the Contractor is responsible for finding a new source(s), and undertaking additional sampling and testing as required for source approval by the Departmental Representative. The Contractor is responsible for all costs associated with changing stone sources. In addition, no extension in the required completion date for this Contract will be allowed because of changing stone sources.
- .4 No additional time will be added to Contract milestones or delivery dates for the time required for the Departmental Representative to make a determination of acceptance or rejection of the proposed source(s).

1.10 QUALITY ASSURANCE

- .1 General
 - .1 Quality Assurance (QA) activities shall be performed by the Departmental Representative. These activities are intended to provide independent observations of conformance to the requirements of this Section prior to shipment of the stone to the site, and in no way relieve the Contractor of his responsibilities for Quality Control and in-place requirements.
 - .2 The Contractor shall provide equipment and operations to turn and handle disputable stone that should be revaluated by the Departmental Representative.
 - .3 In the event that the Departmental Representative's QA activities indicate non-conformance to the requirements of this Section, the Departmental Representative will reject the non-conforming stones. Materials rejected at the source shall be immediately marked (with a red "X" on three mutually perpendicular sides), segregated and removed from the the stockpile area.
 - .4 If the Departmental Representative, during his QA activities, finds that the quality of stone being furnished is not as specified or is questionable, additional sampling and laboratory testing may be required. The selection of samples (from stockpiles at the site, source or intermediate location, such as a loading dock), and the required testing of stones, shall be as directed by the Departmental Representative. The Contractor shall pay all costs associated with the additional sampling and laboratory testing of stone.
 - .5 Continued non-conformance will be considered justification for rejection like describe in section.

Part 2 Products

2.1 GENERAL

- .1 All stone materials to be furnished under this Contract shall meet all requirements specified in this Section of the specifications. The Departmental Representative, at any time during the Contract, may reject materials at the source to the deposit site and are rejected.
- .2 The SMC Plan and QC/QA activities shall be systematically applied throughout the duration of quarry and construction operations for this project.

2.2 MATERIALS

- .1 Stones must be uniformly distributed between the minimal and maximal values for all the categories asked in specifications.
- .2 Petrographic maximum number: 130.

2.3 STONE SOURCES

- .1 The Contractor shall be solely responsible that the selected source(s) can meet the delivery schedule and produce the quality and quantity of stone required for the project.
- .2 If the Contractor is unable to obtain a sufficient quantity of acceptable stone materials from the original source(s) during the Contract, the Contractor may request approval to use an alternative source(s). The Contractor will be responsible for all costs associated with changing stone sources, including additional sampling, and testing as required for source approval. In addition, no extension in the required completion date for this Contract will be allowed.
- .3 The implemented stone must be extracted from a quarry of hard stone and sustainable.

2.4 STONE QUALITY REQUIREMENTS

- .1 General (All stone)
 - .1 All stone shall be highly resistant to weathering, deterioration or disintegration under freeze-thaw and wetting-drying conditions and shall be of a quality to ensure permanence of the structure in the climate in which it is to be used. The stone shall be durable, sound and free from detrimental cracks, seems and other defects, which tend to increase deterioration from natural causes or cause breakage during handling and/or placing. Argillaceous stone or stone with high shale content is more susceptible to weathering, abrasion, thin bedding, close fracturing and other undesirable rock properties and shall not be accepted. Inclusions of dirt, sand, clay, shale, chert, micaceous minerals, pegmatite, oil and oil-stained stones and rock fines or any organic or other deleterious material will not be permitted.
 - .2 The use of shale or slate and round stones will not be accepted in any part of the project. The stones used will be free from elements such as stratification, bedding, cracks, mudstone, etc.
- .2 Armour Stone A-Class
 - .1 Sandstone and conglomerate materials will NOT be acceptable as Armour stone for this project, whatever the conformity of other specifications.
 - .2 Is there an uncertainty for sandstone or not, the stone shall have a petrography exam (ASTM C295-03). The laboratory fees will be Contractor's expenses.
 - .3 Categories for stone A class are:
 - .1 Filter stones from 0,4-0,9 tm
 - .2 Armor stones from 4 to 9 tm
- .3 Quarry run

- .1 Quarry run must be a byproduct from armor rock production and must be clean and fine particles free. Granulometry must be spreaded from 0 to 300 mm.

2.5 TESTS

- .1 Inform the Departmental Representative of the proposed source for rocks and stones, and ensure access to that source for sampling, at least four (4) weeks before the start of production at the quarry.
- .2 During this period of four (4) weeks, a minimum period of two (2) weeks is required for laboratory tests.
- .3 The Departmental Representative could request for other tests during the project. The cost for laboratory tests shall be paid by the Departmental Representative unless the tests show some irregularities of materials, in which case the Contractor shall bear the costs.
- .4 At all times, the stone samples for testing will be collected in the presence of the representative of the laboratory or the Departmental Representative.

2.6 SORTING OF THE STONES

- .1 Each stone category to be used will be sorted and placed in separate piles in the quarry.
- .2 The stones deemed out of the established limits must be removed and replaced with others that meet the requirements. They can be rejected be it at the quarry or at the site.

2.7 TOLERANCE ON THE SHAPE OF THE STONES

- .1 Ballast stones: the smallest size of stones should not be less than 305mm.
- .2 All stones with a ratio from the largest size to the smallest which is greater than 3 will be rejected.
- .3 The stones with ratios from the largest sizes to the smallest between 2.5 and 3 shall not be laid flat on the slope or under water when they are being placed.
- .4 For stones whose ratio from the largest size to the smallest is less than 2.5 can be used in the structure without any particular placement criteria.
- .5 The stone will be transported by category and the supervisor must be notified in advance of the categories of stone to be transported and where it will be used on the structure.

2.8 TOLERANCE ON THE WEIGHT OF THE STONES

- .1 At least 90% of stone weight, of same class, listed placed in work shall weight a mass included within this class weight limits.
- .2 At most 5% of stone weight, of same class, listed could weight between 0.75 time and one time minimum required weight for this class.
- .3 Any stone whose weight will be inferior to 0.75 time minimum weight of superior to 1.25 times maximum weight of class in which it is classified will be refused, removed from quantities and shall be removed from worksite.
- .4 In case of contestation about Departmental Representative's decision, Contractor shall demonstrate that involved stones totally meet preceding criteria.

- .5 Every broken stones during handling or shipping shall be revaluated based on previous criteria.
- .6 Stones in the same category shall be evenly distributed according to their sizes (following allowed values) in all armour rock protection, so as to avoid concentration of stones with the same sizes in some areas within a given category.
- .7 The stone shall be angular or oblong shape with a ratio short-dimensional (l/d) up to 3/1. It should not be more than 10% of stone having a dimensional ratio greater than 2.5/1.

Table 1 - Quality tests required for stone - Delivery methods and criteria

Name of test	Testing method	Delivery criteria
		Class 'A' stone
On-site review / Visual observation / Evaluation		
On-site review ¹	ASTM D4992-07	No sand or cement No deleterious materials; excellent quality for earmarked usage
Petrographic review ²	ASTM C295-03	No deleterious materials; excellent quality for earmarked usage
Resistance to alteration	Visual	IA – fresh unaltered stone IB – slightly altered stone (marks on the main boundary surfaces)
Laboratory tests		
Density, SSD	ASTM C127-07	2.65 to 2.85
Water absorption ³	ASTM C127-07	≤ 0.5%
Compression Strength ⁴	ASTM D7012-07	≥ 100 MPa
Micro-Deval wear resistance ⁵	ASTM D6928-06	≤ 15
MgSO integrity ⁴	ASTM C88-05	≤ 1.5% loss after 5 cycles
Petrographic review ²	ASTM C295-03	No deleterious materials; excellent quality for earmarked usage

Notes:

- 1 The on-site assessment must include a report which will summarize the characteristics of the quarry and propose a development plan for it in accordance with ASTM D4992-07 standards: general lithology; geological unit and age; homogeneity of the source; stratigraphic faces; metamorphic and alteration phases; the dip, direction and thickness of the stratification; proposed blasting procedure and scheduled duration of curing.
- 2 Petrographic review must be repeated before and after MgSO₄ integrity tests. It should be summarized in a written report, with the geological name of the stone, state of alteration, main constituents, texture, anisotropy and porosity. In addition, the report must indicate the presence of constituents, the presence of micro-fractures and / or induced stress signs (and, therefore, any possible stress release - see Section 3.2) that can be a source of problems for the proposed use and discussions thereof.
- 3 The water absorption test should be repeated on five (5) different pieces of stone.
- 4 The compression strength test should be repeated on three (3) different pieces of stone.
- 5 The micro-Deval wear resistance test should be repeated on two (2) different pieces of stone.

Part 3 EXECUTION

3.1 PRODUCTION QUALITY CONTROL

- .1 The Contractor shall perform Quality Control activities throughout the duration of stone production and placement operations in accordance with the requirements of this Section and Section 01 45 00
- .2 Weighing of stones or re-measuring them shall be performed to verify computed weights when the Department Representative brings the size of specific stones into question, or when the SMC inspector observes the need to do so.
- .3 Drop tests shall be performed when the Departmental Representative questions the quality or integrity of specific armour stones, or when the SMC inspector observes the need to do so. Drop tests shall be undertaken as follows:
 - .1 Visually inspect all sides of the stone, and mark/record existing cracks;
 - .2 Lift and drop stone from a height of 3 m onto a rigid surface (bedrock, or similarly sized stone);
 - .3 Visually inspect all sides of the stones for cracks for the opening of existing cracks and/or the development of new cracks;
 - .4 Repeat at least 3 times, as directed by Departmental Representative;
 - .5 Stone is acceptable for use if there is no opening of existing cracks and no development of new cracks.

3.2 TRANSPORTATION AND TEMPORARY STOCKAGE

- .1 The Contractor must arrange transport, loading and implementation of the stones to ensure that the categories are not contaminated by dirt and other materials and to reduce the segregation of materials by size.
- .2 Storage, loading and implementation of stones following the dispatch of the quarry shall be subject to the approval of the Department Representative.

3.3 PLACEMENT OF STONES

- .1 For stone placement requirements Refer to Section 35 31 25 – Placement of Stones.

END OF SECTION

Part 1 General

1.1 SCOPE

The work covered by this Section includes all operations related to the establishment of the stone which is required for the continuation of the riprap near the south main wharf.

1.2 RELATED REQUIREMENTS

- .1 Section 35 31 24 – Stone production

1.3 SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 The following information shall be submitted to the Departmental Representative.
 - .1 Construction Equipment and Procedures: At least ten (10) work days prior to starting Work, the Contractor shall submit his construction procedures which must including :
 - .1 A list of all equipment and machinery to be used;
 - .2 Detailed of stone placement methods for each category and the placement sequencing;
 - .2 Inspection Techniques and Surveying Methods: At least ten (10) working days before undertaking the placement of stones in the structure, the Contractor shall provide the Departmental Representative with the following information for review:
 - .1 Inspection techniques and evaluation criteria applied to the placement of the stones in the structures.
 - .2 Details of survey methods implemented to ensure accurate placement, including alignment, levelling and the control of transverse sections during construction.
 - .3 After review by the Departmental Representative, this submittal shall be included in the detailed quality control plan.
 - .3 Weigh scale operators
 - .1 The Contractor shall provide weigh scale operators and assume all costs.
 - .4 Other weighing devices
 - .1 Submit the details of the devices used to weigh individual stones. The contractor will assume the costs of these devices.
 - .5 Certified weight scale tickets
 - .1 A copy of each weight scale tickets, including certification of exact weight, time of weighing and of delivery shall be submitted to the Departmental Representative within one (1) working day after weighting.
 - .6 Existing conditions and verification survey data: A copy of the record of each verification survey, including existing conditions, shall be submitted to the

Departmental Representative within one (1) working day after the survey.
Provide submittal in both hard copy and digital formats.

- .7 Stone Placement Reports: The Contractor shall submit daily stone placement reports. The reports shall display, as a minimum, the following information: an estimate of the total tonnage placed; chainings along the control line (LC) between which stones were placed; and the total placement time. The Contractor shall also update work progress drawings indicating dates and locations of stone placement and verification surveys for each layer of stone, for review by the Departmental Representative at any time.

1.4 ASSURANCE QUALITY

- .1 Approvals of regulatory authorities with regard to the durability: Conform to the codes and to the municipal, provincial and national regulations concerning the present works.

1.5 CONDITION OF IMPLEMENTATION

- .1 Before presenting his submission, the Contractor is responsible to go to the works site to inspect and obtain all the necessary information concerning the nature and the reach of the works as well as the set of the conditions which can influence the execution the works.
- .2 Take the necessary means to know well the difficulties that unfavorable weather and maritime conditions in this region can cause.

Part 2 PRODUCTS

2.1 STONE

- .1 All the stone used on this project shall meet the requirements of Section 35 31 24 – Production of Stone.

Part 3 EXECUTION

3.1 QUALITY CONTROL OF STONE PLACEMENT

- .1 General
 - .1 The Contractor is responsible for Quality Control and shall establish and maintain a Quality Control Plan ACCORDINGLY TO Section 01 45 00 – Quality control and Section 35 21 24 – Production of stone.
 - .2 The Contractor shall keep records of all quality control tests, surveys, inspections, including corrective measures implemented and provide copies to the Departmental Representative.
- .2 Survey Control
 - .1 The Contractor shall provide range poles, marker buoys, templates, batter boards and/or any other means of guidance and control required to place the successive stone layers within construction tolerance.

- .2 The Contractor shall provide and maintain chainage markers at 15 metre intervals along the work area. Chainage markers shall be visible in both directions along the chaining.
- .3 Supply, install and maintain tide scale. Install the instrument to allow direct reading of water level with reference to tidal datum. The type of instrument and its location shall be approved by the Departmental Representative.
- .3 Verification Surveys
 - .1 Object
 - .1 The Contractor shall carry out verification surveys as work progresses to ensure that the lines, elevations and course thicknesses of work performed are within specified tolerances.
 - .2 Scope
 - .1 Verification surveys on the existing structure are required before and after excavation, and then for each layer of stone placed. Each verification survey shall consist of cross-sections of the structure carried out by the Contractor at intervals of ten metres (10 m) along the control line (CL).
 - .2 For the half-circular end of the breakwater, radial sections shall be taken at 15-degree intervals from the center. Verification surveys shall be carried out from the same locations along the CL of the half-circular section and along the radials before and after the excavation and placing of stone.
 - .3 Take elevation readings at 1,5 m intervals and at every theoretical break in grade, to a distance not less than 3 m beyond the limits of the stone course being surveyed. Carry out other elevation readings as directed by the Departmental Representative.
 - .4 Other cross sections spacing and reading intervals may be used if deemed appropriate by the Departmental Representative.
 - .3 Equipment
 - .1 Carry out verification surveys using a DGPS, a total station survey instrument and range pole-mounted prism, a surveyor's level, range pole and surveyor's tape; tagline and sounding basket; or other methods in accordance with this section and subject to Departmental Representative's approval. If range poles or soundings poles are used, these devices shall be fitted with a flat, durable 30 cm diameter base.
 - .2 Carry out depth measurement by physical contact with the stone using, for example, sounding poles or leadlines. Sonic or electronic measurement are not authorized for depth measurement. Accuracy shall be better than 6 cm.
 - .3 Other measurement methods using sonic or electronic methods may be considered subject to approval by the Departmental Representative. The Contractor shall submit evidence of the accuracy of any other method and submit detailed comparison with measurement done by physical contact for all courses of stone.
 - .4 The Contractor shall provide all boats, personnel all the equipment required to carry out verification surveys safely.

- .4 Execution
 - .1 Above water surveys shall be undertaken using conventional land survey methods. For underwater surveys, the Contractor shall move by boat or platform as needed, to each required reading location to cover the whole structure, including the tidal zone.
 - .2 All survey verifications are conducted using the survey control line (LC) and chart datum (CD).
 - .3 Survey verifications shall be carried out in the presence of the Departmental Representative unless the latter declines to attend.
 - .4 For each verification survey carried out, the Contractor shall provide the Departmental Representative with a record of verification surveys displaying the following information:
 - .1 Location of the verification survey (station along the control line);
 - .2 Category of stone surveyed;
 - .3 Date and time of the survey;
 - .4 Weather conditions;
 - .5 Tide gauge readings at the time of the survey;
 - .6 Name of participants;
 - .7 Field notes;
 - .8 Plot on cross-section paper showing the control line, neat lines and individual elevation readings.
 - .5 The exact format of the verification survey record shall be agreed upon by the Departmental Representative and the Contractor.
 - .6 The verification surveys of the underlying material (i.e., the existing structure, or the previously placed course of stone) carried out by the contractor involved shall be verified by the Departmental Representative before the next course of stone is placed.

3.2 STONE PLACEMENT

- .1 General
 - .1 Stones shall be placed individually as indicated sloped and drawings within the tolerances described in this section.
 - .2 Stones of the same category shall be evenly spread by size throughout the work in such way as to avoid concentrations of same size stones in the same area.
 - .3 The equipment used to place the stones shall be capable of placing the stones without dropping them from more than 0.3 m above final position; the equipment shall also allow to move the stones and rework their position if need be.
 - .4 Place the stones and ensure that they rest firmly onto the stones below and are in steady contact with surrounding stones; to archive adequate lodging, it may be necessary to change the arrangement of existing adjacent stones.
 - .5 Stones must be placed without regular pattern and randomly oriented in such way that joints with adjacent stones are not aligned.

- .6 Perform outer slope finish as the layer of armour stone is placed. The finished slope shall be even and without any voids that can pass the smaller stones underlying filter.
 - .7 The approval of stone placement and/or of survey verifications of a course or portion of course is not a final acceptance. Stone work shall be considered final when the Departmental Representative approves the placement and the verification surveys for all courses in the work zone.
 - .8 Before final acceptance, any damage to the existing structure or to partially built or approved stone courses shall be repaired by the Contractor at own expense whether such damage results from Contractor's or subcontractor's operations, or from the action of wind, waves, tides or ice.
 - .9 Place stones carefully and avoid damaging adjacent structures. In case of damage, all repair and/or replacement costs resulting from a lack of precaution shall be at Contractor's expense.
 - .10 Placement using any method likely to cause segregation in a given category of stone is not authorised. Placement shall begin at the toe of the slope and proceed upward. Casting of stone or moving by drifting or manipulating down the slope is not permitted. Final slope and elevation are to be achieved as stones are placed.
- .2 Filter stone
- .1 End dumping and dozing of quarry-run material and of stones between are not authorized. Place by clamshell, dragline, backhoe or similar equipment to ensure that the materials are evenly distributed on the seabed or excavated structure or previously placed material. Stones shall not be released from higher than 0,6 m of final location.
 - .2 All the materials shall be placed evenly along the lines and slopes as indicated on the contract drawings and within tolerances as described in this section.
 - .3 Handle and place materials to minimize segregation, to yield an evenly arranged mass in terms of sizes, and to perform the required in situ gradation.
- .3 Degradation/contamination of stone layers resulting from Contractor's operations
- .1 The finished structure shall be free of undersize materials including materials used in the access road as well as fractured or other materials chosen by the Contractor to assist him in the construction. The use of mats, geotextiles or other temporary working surfaces for which removal can be verified is preferred. Any other method is subject to the approval of the Departmental Representative.
 - .2 Contractor is responsible to remove and replace any stone materials that are damaged/degraded during the works to the extent that they do not meet the requirements of these specifications.

3.3 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.

3.4 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 (10) square metres (m2) 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	BELOW CHART
Armour stone	40 cm	50 cm
Filter stone	25 cm	30 cm
Quarry-run	20 cm	30 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 within +/- 60 cm the indications on the contract drawings. This 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.

3.5 CIRCULATION ON THE COMMERCIAL WHARF

- .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 it done and removed 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.

3.6 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.

3.7 TURBIDITY CONTROL

- .1 The Contractor shall control stone placement in such way as to minimize water turbidity.

3.8 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.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A276 / A276M - 16 Standard Specification for Stainless Steel Bars and Shapes
 - .2 ASTM D4491-99a (2009), Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
 - .3 ASTM D4595-09, Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
 - .4 ASTM D4716-08, Standard Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
 - .5 ASTM D4751-04, Standard Test Method for Determining Apparent Opening Size of a Geotextile.
- .2 CSA International
 - .1 CSA-A23.1/A23.2-2014, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA A3000-13, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-4.2 No. 11.2-2004, Textile Test Methods - Bursting Strength - Ball Burst Test (Extension of September 1989).
 - .2 CAN/CGSB-148.1, Methods of Testing Geotextiles and Complete Geomembranes.
 - .1 No.2-M85, Methods of Testing Geosynthetics - Mass per Unit Area.
 - .2 No.3-M85, Methods of Testing Geosynthetics - Thickness of Geotextiles.
 - .3 No.6.1-93, Methods of Testing Geotextiles and Geomembranes - Bursting Strength of Geotextiles Under No Compressive Load.
 - .4 No.7.3-92, Methods of Testing Geotextiles and Geomembranes - Grab Tensile Test for Geotextiles.
 - .5 No. 10-94, Methods of Testing Geosynthetics - Geotextiles - Filtration Opening Size.

1.2 DEFINITIONS

- .1 **Articulated concrete block mats:** The articulated concrete block mat, commonly called scour protection mat or ACBM, is made up of concrete blocks connected by wires. A geotextile is placed underneath the blocks. Placed on the seabed beside wharf, it helps to prevent scouring.

1.3 ACTION/INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for product and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Methods of joining

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements, with manufacturer's written instructions.
- .2 Storage and Handling Requirements:
 - .1 Store and handle ACBM such that they are protect against spalling and cable breakage
 - .2 Store and protect ACBM from direct sunlight and UV rays.
 - .3 Replace defective or damaged materials with new.
- .3 Packaging Waste Management: remove for reuse or elimination in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .4 Use appropriated tools for ABCM's handling operation.

Part 2 Products

2.1 MATERIALS

- .1 ACBM provide in section
 - .1 Total thickness of TBBA: 200 mm.
 - .2 Mats interconnexions available on 4 sides
 - .3 Stainless steel wire of grade 316
 - .4 Mats interconnexion: Forged wire rope clips, stainless steel 316
 - .5 Concrete compressive strength at 28 days : 35 Mpa
 - .6 Concrete air content: 5 - 8%

Part 3 Execution

3.1 EXAMINATION

- .1 Checking conditions: before installing the ACMB, ensure that the condition of surfaces/materials that were previously carried out under other sections or contracts is acceptable and can allow works to be completed according to manufacturer's instructions.
 - .1 Do a visual inspection of surfaces/materials in the presence of Departmental Representative.

- .2 Immediately inform the Departmental Representative of any identified unacceptable condition.
- .3 Start installation only after correcting the unacceptable conditions and receiving a written approval from the Departmental Representative.

3.2 PLACING

- .1 Place the ACMB directly on foundations so they rest uniformly without creating undesired artificial deformation.
- .2 Then connect the ACMBs to each other with a sufficient number of connections, following the directives of the manufacturer
- .3 Replace damaged ACMBs, to the satisfaction of the Departmental Representative.

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/recycling or elimination in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

END OF SECTION

Part 1 General

1.1 MEASUREMENT AND PAYMENT

- .1 Fenders will be paid for as unit item.
- .2 Measure fenders by units supplied and incorporated into work.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM D412-06ae2, Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension.
 - .2 ASTM D429-08, Standard Test Methods for Rubber Property - Adhesion to Rigid Substrates.
 - .3 ASTM D2240-05(2010), Standard Test Method for Rubber Property - Durometer Hardness.

1.3 ACTION/INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
 - .1 Indicate items as follows:
 - .1 General arrangement of fender units.
 - .2 Location and sizes of anchor bolts.
 - .3 Arrangement and attachment
 - .4 Supporting system and connection
- .3 Test and Evaluation Reports: submit reports signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

1.4 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 clean area.
 - .2 Store and protect materials from nicks, scratches, and blemishes and others damages.
 - .3 Replace defective or damaged materials with new.
- .4 Waste Management: separate waste materials for reuse, recycling or elimination in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 MATERIALS

- .1 Fender type D, D bored, one piece fender
- .2 Materials : SBR ou EPDM
- .3 Physical properties:

Property	Test Method	Requirements
Minimum Tensile Strength	ASTM D412	10 MPa
Minimum Elongation at Break	ASTM D412	300%
Hardness, Shore (A) Durometer	ASTM D2240	70 +/-5

- .4 Minimum energy absorption capacity at 50 % deflection: 3.2 kN-m
- .5 Maximum allowable reaction at minimum energy absorption capacity: 115 kN
- .6 To be of monolithic construction.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for rubber marine fender 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.
- .2 Fender will be located in splash zone, and may in addition be partially submerged in sea-water.
- .3 Mean annual maximum and minimum temperatures are 20 degrees C and -15 degrees C.¹

3.2 INSTALLATION

- .1 Install in accordance with manufacturer's instructions and drawings as indicated.
- .2 Alter system components in accordance with written permission of Departmental Representative.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 – Cleaning.

¹ <http://legacyweb.meteomedia.com/statistics/temperature/cl7051055/caqc5310>

- .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, recycling or elimination in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

END OF SECTION

APPENDIX 1

WHARF FACE



QUEBEC REGION



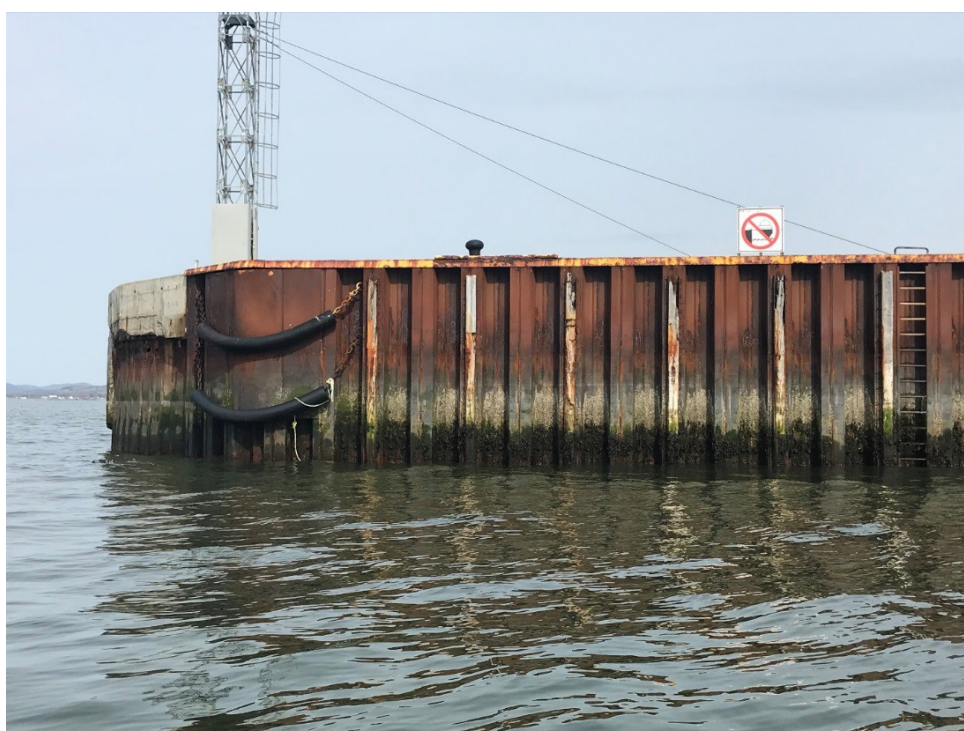
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APPENDIX 1

SURFACE ELEMENTS



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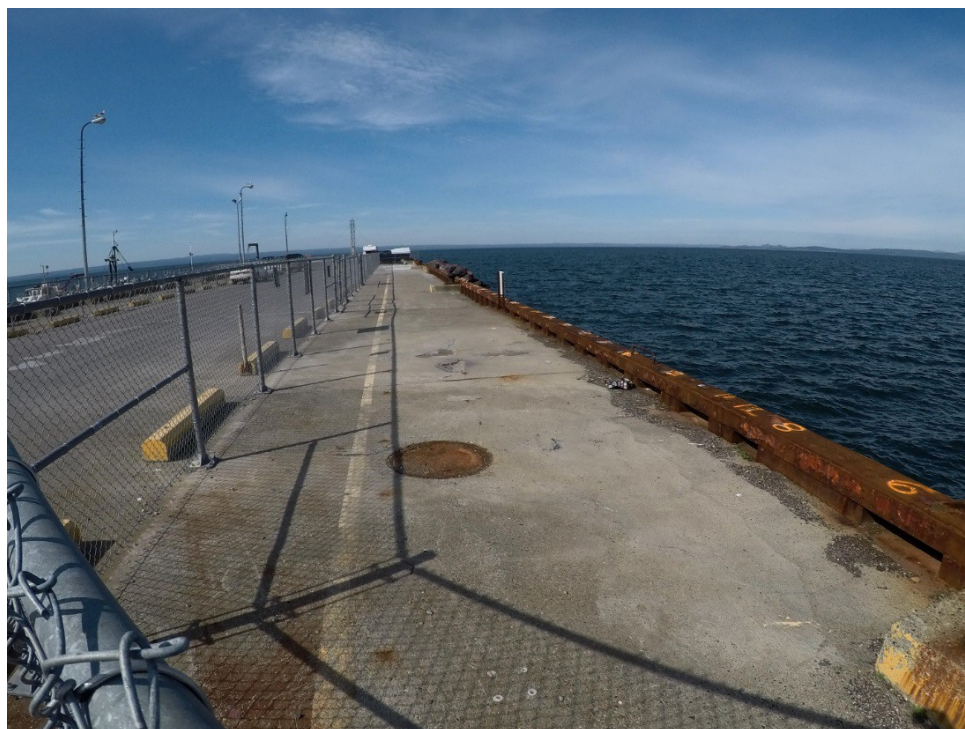


QUEBEC REGION



QUEBEC REGION





Appendix 2

