



**Pêches et Océans  
Canada**

**Fisheries and Oceans  
Canada**



**Ports pour Petits Bateaux  
Small Craft Harbours**

**RIVIÈRE-AU-RENARD  
PLANT WHARF RECONSTRUCTION – PHASE II**

**PROJECT N° 722 217**

**SPECIFICATION FOR TENDER**

**NOVEMBER 2019**





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FOR TENDER

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PLANT WHARF RECONSTRUCTION – PHASE II

PROJECT N°722 217

MARINE WORKS :



**Prepared by** Frédéric Richard, ing.



**RIVIERE-AU-RENARD**

Project n°: 722 217

**Plant wharf reconstruction- Phase II**

November 2019

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**END OF SECTION**

**Part 1            General**

**1.1                WORK LOCATION**

- .1        Work will take place in Rivière au Renard harbour, on plant wharf owned by Department of fisheries and oceans – Small raft harbour, by :

Les Pêcheries Marinard ltée  
41, rue de l'Entrepôt  
Gaspé, Québec  
G4X 5L3

**1.2                WORK DESCRIPTION**

- .1        The works covered by this contract include :
- .1        Consolidation of a berlin wall at unloading wharf, with armour rock embankment;
  - .2        Construction of a passage for forklift made of cribwork by the fish plant;
  - .3        Construction of a new unloading wharf also made of cribwork;
  - .4        Project also includes removal and installation of wharf equipment and various works.

**1.3                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.

**1.4                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. .

**1.5                CONTRACTOR USE OF PREMISES**

- .1        Contractor has access to work site until substantial completion of works.

- .2 The area accessible to Contractor is indicated on the plan. Contractor could access to unloading wharf by winter boat storage lot located next to worksite is owned by *L'Association des Capitaines propriétaires de la Gaspésie* and use of premises shall be at condition of owner. Contractor shall get in touch with those people to arrange for use of lot and return to original state, etc. If Contractor wishes to use other parcels of land, he must reach an agreement with the owners concerned and pay for it. A copy of the agreement shall be sent to the Departmental Representative.
- .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 For handling and launching of cribwork, l'Association des Capitaine propriétaires de la Gaspésie (ACPGP) will evaluate the possibility to give support to contractor by renting their travel lift. Contractor is responsible to get in touch and for making arrangement. No agreement has been concluded between ACPG and DFO, meaning DFO could not be held responsible in case of a dispute. Contractor shall plan ahead to install temporary lifting points for handling of cribs because handling of cribwork causes damage travel lift slings if used under crib. Contractor shall provide mean of handling crib at ACPG's satisfaction and assume all costs for damages to equipment.
- .6 Work phases :
  - .1 Phase 1 of works consist of construction of a new spur wharf where unloading activities will be transferred.
  - .2 Cribwork prefabrication for spur wharf shall begin upon material delivery and material orders shall be proceeded right after contract award.
  - .3 Cribwork installation must be completed 5 months after contract award.
  - .4 Cribwork installation will occur while fishing season is ongoing. During that phase, existing unloading wharf will be operational. Contractor shall maintain a continuous coordination of his operations with fish plant management. Unloading schedule will be provided 1 week in advance. It is to be considered that unloading schedule could change due to weather condition and rate of fishing success. Contractor shall adjust his schedule accordingly.
  - .5 During phase 1 contractor will be allowed to circulate on existing plant wharf. Handling of material will have to be coordinated with users operations.
  - .6 After works on spur wharf are completed, fish plant will transfer its unloading operations to new wharf. A two weeks timeslot will be required for that transfer.
  - .7 Phase 2 works are related to construction of pathway by the fish plant, in former unloading station.
  - .8 During that period, contractor will be allowed to work on armor rock embankment, foundation for new cribwork and fabrication of cribwork for passage by the fish plant, but no operation shall occur between new spur wharf and existing unloading wharf, inside limits of wharf.
  - .9 When unloading wharf will be operational, work area on the side of fish plant (former unloading wharf), will be available for contractor.



- .10 During phase 2, fish plant will use existing wharf for handling operations with forklifts. Contractor will complete works by the fish plant during that period.
- .11 All works must be completed 8 months after contract award.
- .7 Design load are shown on plan. Contractor shall provide with his bid considering existing conditions, with regard to material transport and heavy equipment use. An attention must be paid to concrete pouring for slab, because a full ready mix exceeds design load. Spec. sheet of all equipment shall be provided for verification.
- .8 Consider presence of an ice pipe and structure over existing plant wharf.
- .9 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 work area.

## **1.6 EXISTING UTILITY SERVICES**

- .1 No services will be provided to the Contractor for execution of works. The later shall provide their own water, electricity, etc. Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission.
- .2 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.
- .3 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.
- .4 Provide alternative routes for users.
- .5 Establish location and extent of service lines in area of work before starting Work. Notify Departmental Representative of findings.
- .6 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.
- .7 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .8 Record locations of maintained, re-routed and abandoned service lines.
- .9 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

## **1.7 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.

## **1.8 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**

## **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 and perform maintenance.

## **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 access path.
- .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 sunk or went adrift, they would be bailed out and/or recovered at the expense of the Contractor to the satisfaction of the Departmental Representative.
- .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 provide, within two (2) 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.
- .2 The Contractor shall, within two (2) days after receiving an acceptance notice for the contract, provide a list of hourly rates for his staff.
- .3 The lump sum price and unit prices will include, but not limited to, leasing, equipment installation, equipment, tools, labor, 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.
- .4 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.
- .5 The method used to measure labor, tools or materials for the contract will be as follows:
  - .1 Lump sum works: such jobs will be appraised as a global unit. Contractor shall provide with his bid following actual articles breakdown. Canada could ask to bidding contractors a breakdown of lump sum item following **Annex C**, before contract award in a 48 hours notice following a written notification. Non compliance could lead to bidding refusal. Failure to comply with this requirement could cause refusal of Contractor's bid. After contract award, detail for each item shall be provided by contractor, including : supply, labor, shipping, handling, administrative fees and every other item in description.
  - .1 **Item 1.1 - Mobilization and demobilization**
    - .1 This item will be measured as a global unit and will include all costs related to the shipping 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 floating equipment are not included here, but in item number 1.3.

**Item 1.2 - Site organization**

- .1 This item will be measured as a global unit and will include, but not be limited to, the following:
  - .1 Construction bond 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 and dismantling them around the different areas (construction site, assembly, storage, etc.);
  - .8 Temporary installations at construction sites;
  - .9 Tidiness and snow removal at the construction site and final cleaning;
  - .10 Security services, traffic controller, guards, etc.;
  - .11 All fixed costs and various items 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.
- .3 **Item 1.3 - Mobilization and demobilization of floating equipment**
  - .1 This item will be measured as a global unit and will include, but not be limited to, the following:
    - .1 Shipping for floating equipment and all related fees.
  - .2 This item shall be paid proportionately, that is, 50% when related works begin, and 50% after removal of all floating equipment from the site.
  - .3 Payment for running floating equipment will be included in the unit prices of each related item.
- .4 **Item 1.4 - Dismantling**
  - .1 This item will be measured as a global unit and will include, but not be limited to, the following:
    - .1 Dismantling of cylindrical and homemade fenders at the plant wharf, ladders, mooring bollards and cleats, their respective connection systems. Cylindrical

fenders shall then be handed to the Departmental Representative and other items to be disposed.

- .2 Dismantling of wheel guards and concrete curbs. Steel wheel guard to be recovered. Curbs shall be handed back to departmental representative. .

.5 Item 1.5 - Concrete slab

- .1 This item will be paid following a global unit and will include construction of concrete slabs in the works following the limits specified in the plan.
- .2 The tendered price will include the cost for all labor, machinery, shipping and materials needed for fabrication of slabs. Materials include, among other thing, but are not limited to, concrete, rebar, anchor, formwork, finishing, curing, joints and saw cuts, surface waterproofing as well as any other work not specifically described, but required to carry out such work in accordance with the plans and specifications.
- .3 This item must also include all direct and indirect costs linked to the protection of works and temporary heating during the casting of concrete in cold weather.
- .4 The Contractor shall come up with an installation method that takes into account the capacity of actual wharf. See plan for more details.

.6 Item 1.6 - Crane base

- .1 This item will be paid following a global unit and will include supply and installation of crane base for installation of Marinard fish plant crane.
- .2 Costs will include of all labor, machinery, shipping and material required for fabrication of base. Without being limited to, price includes formwork, rebar, concrete, anchor bolts and electrical conduits as required.
- .3 This item must also include all direct and indirect costs linked to the protection of works and temporary heating during the casting of concrete in cold weather.

.7 Item 1.7 - Treated wooden cribs

- .1 This item will be paid following a global unit and will include the cost of all labor, machinery, shipping and all material required for construction of cribs and their installation such as : timbers, hardware, ballast stone etc. It will include connection brackets between existing wharf and new.
- .2 This item should also include any other work not specifically described, but required to carry out such work, following the plans and specifications.



- .8     Item 1.8 – Slab resurfacing on the existing berlin wall
  - .1     This item will be paid following a global unit. It includes among other things, but will not be limited to, the bush hammering of existing concrete, supply and installation of rebar, anchor bolts, formwork and concrete. This item will include finishing, curing, joints and saw cuts, as well as any other work not specifically described, but required to carry out such work, following the plans and specifications. Covering plate for passage between existing wharf and new cribwork on side of fish plan is included in actual item.
  - .2     This item must also include all direct and indirect costs linked to cold weather concrete pouring among other things works protection and temporary heating during the pouring of concrete in cold weather.
  
- .9     Item 1.9 – Wheel guards : This item is divided as following :
  - .1     Item 1.9.1 – New section of wooden wheel guard.
    - .1     This item will be paid following a global unit and will include the cost for all labor, machinery, shipping and materials needed for the fabrication and installation of wheel guard sections. It also includes anchor bolts as well as any other work not specifically described, but required to carry out such work, following the plans and specifications.
  - .2     Item 1.9.2 – Modification and installation of recovered steel wheel guard.
    - .1     This item will be paid following a global unit and will include modification of different standard sections of galvanized steel curbs to be reinstalled on the structure according to the limits specified in the plan. The tendered price will include the cost for all labor, machinery, zinc rich painting on modified sections. It also includes anchor bolts and grout levelling, as well as any other work not specifically described, but required to carry out such work, following the plans and specifications.
  
- .10    Item 1.10 – 20-ton mooring bollards
  - .1     This item will be paid following a global unit and will include supply and installation of new and recovered 20-ton bollards and a concrete base on structure according to the limits specified in plans. The tendered price will include the cost for all labor, machinery, shipping and

materials required, including, among other things, but not limited to, bollards, anchor bolts, concrete, rebar, form work, levelling with grout and any other job not specifically described but required to carry out such work following the plans and specifications.

- .2 This item must also include all direct and indirect costs linked to the protection of works and temporary heating during the casting of concrete in cold weather.

.11 Item 1.11 – Ladders This item is divided as following

.1 Item 1.11.1 – New ladders.

- .1 This item will be paid following a global unit and will include supply and installation of ladders on the structure, following limits specified in plan. The tendered price will include the cost for all labor, machinery, shipping and materials needed, including, among other things, but not limited to, galvanized steel components and anchors, two fenders on both sides of ladder and fabricated metal, as well as any other job not specifically described but required to carry out such work following the plans and specifications.

.2 Item 1.11.2 – Recovered ladders.

- .2 This item will be paid following a global unit and will include removal, modification and reinstallation of ladders on new wharf, following limits specified in plan. The tendered price will include the cost for all labor, machinery, shipping and materials needed, including, among other things, but not limited to, galvanized steel components and anchors, fabricated metal, as well as any other job not specifically described but required to carry out such work following the plans and specifications.

.12 Item 1.12 - Fenders: This item is broken down as follow

.1 Item 1.12.1 - New fenders

- .1 This item will be paid following a global unit and will include supply and installation of fenders on the structure, following the limits specified in the plan. The tendered price will include the cost for all labor, machinery, shipping and materials needed, including, among other things, but not limited to, fabricated metal and hardware required for installation as well as any other job not specifically described but required to carry out such work following the plans and specifications.

**.1     Item 1.12.2 - Recovered fenders**

- .1     This item will be paid following a global unit and will include removal, modification to recovered fenders and reinstallation on new cribwork. The tendered price will include the cost for all labor, machinery, shipping and materials needed , including, among other things, but not limited to, fabricated metal and hardware required to install them as well as any other job not specifically described but required to carry out such work following the plans and specifications.

**.13    Item 1.13 - Articulated Concrete Block Mats (ACBM)**

**.1     Item 1.13.1 – New articulated concrete block mats (ACBM)**

- .1     This item will be paid following a global unit and will include supply and installation of articulated concrete block mats on marine bottom, following the limits specified in the plan. The tendered price will include the cost for all labor, the team of divers, machinery, shipping and materials required including, among other things, but not limited to, ACBMs and attachment system, as well as any other job not specifically described but required to carry out such work following the plans and specifications. Contractor shall use a lifting frame of proper size so concrete mats are not damaged by excessive flexion.

**.2     Item 1.13.2 – Recovered articulated concrete block mats (ACBM)**

- .1     This item will be paid following a global unit and will include removal and installation of recovered articulated concrete block mats on marine bottom, following the limits specified in the plan. The tendered price will include the cost for all labor, the team of divers, machinery, handling and required material including, among other things, but not limited to : attachment system, as well as any other job not specifically described but required to carry out such work following the plans and specifications. Contractor shall use a lifting frame of proper size so concrete mats are not damaged by excessive flexion.

**.14    Item 1.14 – Fixed protective posts**

- .1     This item will be paid following a global unit t and will include supply and installation of protective bollards on

structure, following the limits specified in the plan. The tendered price will include the cost for all labor, machinery, shipping and materials needed, including, among other things, but not limited to, bollards and anchor bolts, as well as any other job not specifically described but required to carry out such work following the plans and specifications.

.15 Item 1.15 – Electrical conduits

- .2 This item will be paid following a global unit and will include supply and installation of electrical conduits as shown on plan, including in new cribwork and external conduit on existing wharf. Item includes all accessories, sleeve and required fixtures.

- .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 2 - Foundation for cribs

- .1 This item will be measured by the ton installed within limits of works, and will include the cost for all labor, machinery, shipping and materials needed as well as levelling. This item also includes stones under crib by the fish plant. Because of ongoing fishing activities, it will not be allowed to construct a temporary access to install foundation of spur wharf.

.2 Item 3 - Armor rock protection on berlin wall

- .1 This item will be measured by the ton installed for each category of stones and will include, but not be limited to, costs for materials, shipping, labor and equipment required. 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 3.1 –Quarry run

.2 Item 3.2 – 300kg -500kg sized stones.

**END OF SECTION**

**Part 1            General**

**1.1                APPOINTMENT**

- .1      Departmental Representative will appoint and pay for services of testing laboratory for its own quality control requirements.
- .2      The Contractor will have to supply and pay the expenses for laboratory testing for quality insurance and more particularly for what follows:
  - .1      Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
  - .2      Tests and certificates of compliance for aggregates, concrete mixture, products of treatments of the wood, stones 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      Steel 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, Contractor shall pay costs for additional tests or inspections as required by Departmental Representative to verify acceptability of corrected work.

**1.2                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 bring back to initial state what 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 Owner 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. A copy of modification to schedule shall be handed to Department representative every update.
- .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 are described in instructions for tender.

### **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 Removal of existing items;
- .7 Carpentry
- .8 Construction of cribs prior to launch;
- .9 Laying of foundation for cribs;
- .10 Final filling of cribs;
- .11 Formworks and reinforcement;
- .12 Concrete casting;
- .13 Installation of various items;
  - .1 Fenders
  - .2 Ladders
  - .3 Mooring bollards
  - .4 Articulated concrete mat
- .14 Sidewalk
- .15 Rectification of defects
- .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                OTHER REQUIREMENTS**

- .1      Section 03 20 00 – Concrete reinforcing
- .2      Section 03 30 00.01 – Cast in place concrete
- .3      Section 03 41 00 – Precast structural concrete
- .4      Section 05 50 00 – Metal fabrication
- .5      Section 35 31 24 – Stones production
- .6      Section 35 59 13.19 – Rubber marine fenders

**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 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 stony 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 “WORKSITE CONDITIONS / IMPLEMENTATION” 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 “WORKSITE CONDITIONS / IMPLEMENTATION”;
- .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.
- .4 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.

### **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 1<sup>st</sup> 1980 must be equipped with a safety device against overload.
- .4 All mobile cranes with cables manufactured after January 1<sup>st</sup> 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 1<sup>st</sup> 1970, they will have to be equipped with the device at the latest on December 31<sup>st</sup> 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 as defined in CNESST specification shall be protected against fall.
- .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 very 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        Section 01 41 00 – Regulatory requirements
- .2        Section 01 74 21 – Construction-demolition waste management and disposal

### **1.2            DEFINITION**

- .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.

### **1.3            REFERENCES**

- .1        Fisheries Act (2019)
- .2        Canadian Environmental Protection Act, 1999 (1999)
- .3        Canadian Water Navigation Protection Act LPN, L.R.C (2019),
- .4        Politic of Soil Protection and Rehabilitation of Contaminated Sites (MSDEFCC ) and Environmental analyses sampling guide relating to it.
- .5        Dust control : BNQ 2410-300

### **1.4            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, if applicable:



- .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 If applicable , 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.

## **1.5 EMERGENCY MEASURES AND INCIDENT PREVENTION**

- .1 Contractor must ensure that a spill kit is accessible on site for all duration of work to allow for intervention in case of an accidental spill (absorbent, containers etc). Kit must contain enough absorbent rolls to allow for an intervention in harbour or to contain oil products in perimeter of machinery involved by installing a floating barrier.
- .2 When fueling machinery, all measures must be taken to avoid accidental spilling (equipment stabilisation before proceeding, availability of a spill kit etc).
- .3 Contractor must ensure machinery is in good condition and well maintained, to avoid grease, oil and fuel leaks
- .4 Inspect regularly machinery to ensure proper operation and proceed to maintenance according to usual recommendation.

- .5 Contractor shall identify toxic products spill risk that will be used or stored during works. He shall plan for prevention and safety measures, and an emergency plan in case of spill.
- .6 All stationary equipment used near water, or wharf, barge, ship etc. shall be installed on a water tight space in case of a spill. Material required for this measure shall be available onsite.
- .7 Fueling of machinery shall be executed to a distance exceeding 30m from shore, on a watertight surface, or over a containment area of appropriate volume. Those activities shall be executed under a close attention and a spill kit must be available nearby,
- .8 Maintenance of vehicles and machinery, and fuel storage or other hazardous product must be done, if possible, to a 30m distance, minimum. If that distance can not be respected, plan for containment methods.
- .9 In case of an equipment failure of spill, emergency measures must be applied to control situation and if applicable, failure will be repaired immediately. Area affected by toxic waste must be contained, cleaned and contaminated material must be removed and disposed in an authorized site by a specialized company.
- .10 Event must be immediately reported to
  - .1 Environmental and climate change emergency line at : 1800 283 2333,
  - .2 Canadian Coast Guard 1800 363 4735
  - .3 MELCC 1866 694 5454 and
  - .4 to Departmental representative.
  - .5 Numbers shall be displayed onsite. .
- .11 Soil or contaminated material by spill must :
  - .1 Stored and covered with a watertight tarp.
  - .2 Sampled according to *Guide d'échantillonnage à des fins d'analyses environnementales, Cahier 5 : Échantillonnage des sols du CEHQ*
  - .3 Tested in laboratory to detect oil product C10 C50, metals, polyaromatic hydrocarbons (PAHs) and volatile organic compound (VOC).
  - .4 Be managed according to applying regulation and disposed in an authorized site.
- .12 Contaminated water by a spill shall be contained and analysed or managed by a specialized company that will dispose in an *MELCC* approved facility.

## **1.6 FIRES**

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

## **1.7 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.

## **1.8 DEMOLITION WASTE AND EXCAVATED MATERIAL MANAGEMENT**

- .1 Sort materials for reuse/recycling or elimination

- .2 Remove larger material materials and store temporarily these materials on a watertight surface or on a tarpaulin or directly in sealed containers or trucks.
- .3 Carry out supervision of excavation works to detect the presence of contamination.
- .4 Prefer recycling of wood from demolition;
- .5 Do not store wood on ground but use a watertight tarp
- .6 Excavate and sort material according to their level of contamination
- .7 Dispose quickly wood pieces to an authorized site;
- .8 Store contaminated excavation material on watertight tarp and covered while waiting for disposal in an authorized site.
- .9 Manage excavation material according soil analysis and according to *Guide d'intervention – Protection des sols et rehabilitation des terrains contaminés*.
- .10 If material is dropped while transported, it must be recovered and area cleaned.
- .11 All waste material for removal become Contractor's property and remove waste materials from sea bed cleaning at daily regularly scheduled times.
- .12 Waste materials not reused, salvaged, or recycled must be arranged in one or several authorized sites by (MSDEFCC)

#### **1.9 WASTE MATERIAL AND HAZARDOUS MATERIAL**

- .1 Dispose reusable and non reusable material separately.
- .2 Do not leave any waste material onsite;
- .3 Store and dispose of used oil and waste from use of machinery according to applying regulation
- .4 Dispose of all waste material according to applying regulation. Burning, burial, or disposal of waste in water is forbidden.
- .5 It is forbidden to dispose hydrocarbon, paint remover, thinner in water or sewer.
- .6 No hazardous material disposal in water will be tolerated ( oil and waste water). Their disposal must be done according to applying regulation in a way that causes no harm to environment;
- .7 Ensure that all waste and residue from treated wood ( preservation product, empty containers; saw dust) be disposed according to applying regulation.

#### **1.10 WORK ADJACENT TO OR IN WATERWAYS**

- .1 Contractor shall use HF biodegradable oil intended for that specific use for works in or near water.
- .2 Waterways to be kept free of excavated fill, waste material and debris.
- .3 Recover immediately floating debris and take them out of water.
- .4 Store equipment more than 30 meters away from water body and do not circulate on marine bottom. 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.

- .5 Storage area shall be located more than 30 meters away from sensitive area and water body and to a distance of at least 3m from a ditch. Choose a flat surface, or with a slope less than 10%.
- .6 Choose a storage area for material, if applicable, considering its features (access; area; distance from sensitive area).
- .7 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.

#### **1.11 TRANSPORTATION OF MATERIALS**

- .1 Transportation of materials on public roads to the site shall be done from Monday to Saturday from 7:00 a.m to 9:00 p.m 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 Reduce use of engine break to a minimum during equipment and material transport.
- .4 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.
- .5 Use tarpaulin to cover the materials during transportation to reduce emission of fine particles and to avoid exposition to rain and snow.
- .6 Use roads with less residences.
- .7 Regularly clean, or at the request of the Departmental Representative, public roads using a sweeper.
- .8 Respect highway safety rules and applying rules regarding loading limits and speed limits.

#### **1.12 PRESERVING AQUATIC LIFE AT THE PROJECT SITE**

- .1 Carry out works preferably between July 11<sup>th</sup> and April 30<sup>th</sup> (day work only), out of sensitive periods for capelin and smelt and reduce to a minimum duration of works in water.
- .2 Prefer to work from the ground or floating equipment.
- .3 It is forbidden to store any demolition waste in water.
- .4 No demolition waste will be disposed in water. Floating waste shall be immediately recovered and taken out of water. Moreover, floating waste shall be stored 30m from water, so it can't be transported by wind.
- .5 If possible carry out work in tidal zone at low tide or less than 2 hours from low tide.

- .6 Stop works in water if weather condition are not suitable to avoid spreading of sediment out of work zone.
- .7 Proceed to removal of structures during low tide and calm water to avoid spreading of sediment.
- .8 Avoid all sudden movement during work in water.
- .9 Install stones and material as gently as possible rather than dropping them.
- .10 Workers shall be instructed to avoid spreading sediment from marine bottom by doing sudden movement or by leveling marine bottom by turning excavator bucket.
- .11 Carry out work gradually and slowly to avoid spreading of sediment, minimize material disturbance et and avoid to cause lifting of material to surface.
- .12 Ensure that equipment is clean and free of leaks ; invasive species and weed upon arrival onsite and during all works
- .13 Risks of introducing invasive and non native species are reduced by using equipment store on ground before works. Thereafter :
  - .1 For equipment that has been stored on ground before works, contractor shall provide to department representative with a written list of equipment, place of storage and date of launch. Departmental representative must be able to check if equipment are actually clean and stored on ground before works.
  - .2 If contractor's method implies using floating equipment , he must prove that equipment have been cleaned and are free of non native species, considering its previous location, before mobilization toward worksite.
  - .3 If using equipment already launched, it must be proven that equipment remained in St Lawrence estuary of gulf during at least 12 month, or an inspection showing absence of invasive species must be conducted.
- .14 Material bring onsite and installed for installation of cribwork shall be cleaned at arrival and stored under a tarpaulin.
- .15 Contractor shall limit work area where equipment must remain at all times.
- .16 All granular material use in works shall be clean and free of contamination and coming from known quarries and contractor shall provide with proof.
- .17 Put back shore to their original state after works.
- .18 Machinery and equipment used on and under water must use biodegradable oil.

#### **1.13 PROTECTION OF AVIAN LIFE**

- .1 Do not approach of any sea bird colony during breeding and nesting period (between May 15<sup>th</sup> and August 1<sup>st</sup>). Remain at more than 300m from colony and avoid to disturb migrating bird during nesting period.
- .2

#### **1.14 MARINE LIFE IN WORK'S SECTOR**

- .1 Contractors shall be informed and be able to recognize presence of marine mammals and turtle closer than 200m from work zone.

- .2 If a marine mammal or a turtle is present closer than 200m from work zone, stop works and wait for the animal to move away out of 200m zone.
- .3 Avoid night works between April 16<sup>th</sup> and August 31<sup>st</sup> to protect upstream of anadromus and catadromus species.

#### **1.15 POLLUTION CONTROL**

- .1 Stop works requiring use of noisy machinery on Sunday, holidays and on evening between 19:00 and 7:00 or according to municipal regulation.
- .2 Maintain temporary erosion and pollution control features installed under this Contract.
- .3 Control emissions from equipment and plant in accordance with local authorities' emission requirements.
- .4 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.
- .5 Provide temporary enclosures where indicated or directed by Departmental Representative.
- .6 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.
- .7 Use a work method reducing to a minimum dust emission and oxide and / or exhaust emission. If needed, dust emission control can be done using water mist, containment method and if required, other dust reducing product according to BNQ 2410-300.
- .8 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.
- .9 If possible, do not leave the engines of machines and trucks running unnecessarily.
- .10 An up-to-date environmental response kit must be in every machine, including even those for subcontractors.

#### **1.16 ACCIDENT AND BREAKAGE**

- .1 An intervention for environmental emergencies plan must be prepared before work beginning and transmitted to all stakeholders.
- .2 Workers onsite shall be trained for intervention of environmental emergencies.
- .3 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, 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.

#### **1.17 CONSTRUCTION OF TREATED TIMBER CRIBWORK**

- .1 Construction of treated timber cribwork have to be realized at a 30m 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 with tarpaulin during transport and until implementation. Store preferably on less pervious surfaces, as clay and compacted soils, asphalt or concrete far from surface water.
- .4 Use equipment with dust collecting devices.
- .5 Fragments and sawdust will have to be recovered and disposed 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.
- .6 It is mandatory that CCA treated wood be tested with chromotropic acid, to ensure product is well set.
- .7 Wood shall be delivered covered with tarps.
- .8 Proceed to inspection before work to check for surface deposition and to ensure it is dry. Do not use non-compliant material.
- .9 Prefer cutting and fabrication of timber to desired specification before water based treatment.
- .10 Consider adding an water repellant when using water based treatment.
- .11 Discuss with supplier the possibility for CCA treated wood to proceed with an industrial immersion in tank during 24 to 48 hours to remove surplus and avoid release that occurs when installing in water.
- .12 Wood treatment must not be applied in situ. If finishing works has to be completed onsite, wood treatment must not be applied in situ when wood is in contact with water. Prefer low water periods, low tide and without rain.

#### **1.18 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.
- .3 Take action only after receipt of written approval by Departmental Representative.
- .4 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.
- .5 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                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.

**1.2                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      Contractor shall 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.

**1.3                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.

**1.4                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.

## **1.5 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 .

## **1.6 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.

## **1.7 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.

## **1.8 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.

**1.9 MILL TESTS**

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

**1.10 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                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.

**1.6                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.

## **1.7 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.

## **1.8 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.

## **1.9 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.

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**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 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 Location, grade, width, and alignment of construction and hauling roads: subject to approval by Departmental Representative.
- .12 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.
- .13 Provide snow removal during period of Work.
- .14 Remove, upon completion of work, haul roads designated by Departmental Representative.

**1.15 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 74 11 – Cleaning
- .4        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.

**1.4                GUARD RAILS AND BARRICADES**

- .1        Provide secure, rigid guard rails and barricades around deep excavations or where risks are present.
- .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           GENERAL**

- .1        Within text of each specifications section, reference are made to reference standards.
- .2        If there is question as to whether products or systems are in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.
- .3        Cost for such testing will be borne by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

**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        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

#### **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.

#### **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 works. 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**

**1.1 QUALIFICATIONS OF SURVEYOR**

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

**1.2 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.

**1.3 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.

**1.4 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 .

**1.5 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.

**1.6 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.

**1.7 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                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.

**1.3                FINAL CLEANING**

- .1        When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2        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.

**1.4 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

**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 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	<b>Informations center</b> 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 <sup>re</sup> 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

**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            When works are substantially completed, Contractor gives written notice to Departmental representative so he can proceed with final inspection of Work.
  - .2            Departmental Representative Inspection:
    - .1            Departmental Representative and Contractor to inspect Work and identify defects and deficiencies.
    - .2            Following inspection, Departmental representative prepare and submit to contractor a complete list of items to be completed or fixed. If an item is missing on list, contractor has to complete works anyway.
    - .3            Contractor to correct Work as directed and agree on a schedule for next inspection.
  - .3            Substantial completion : when Departmental representative considers that defects and deficiencies are corrected and contracts requirement are fulfilled, a certificated of substantial completion is issued.
  - .4            Works are considered completed when following tasks are done and documents are issued :
    - .1            Work: completed ; inspected and considered compliant to contract documents.
    - .2            Deficiencies and defects noted during inspection are corrected.
    - .3            Certificated and / or proof of proper disposition of trash and material to dispose are issued.
    - .4            Documents in 01 78 00 – Submittals are issued
    - .5            Work is completed and ready for final inspection
  - .5            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.
- .6            Final Payment:
  - .1            At the demobilization, closing notice of construction site shall be transmitted to CNESST, with copy to Departmental representative.
  - .2            Notice of compliance with CNESST stating that contractor has paid his due regarding actual contract. That document must be handed to Departmental representative at the end of works.

- .3 When Departmental Representative considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.

**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                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.

**1.3                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, one (1) final electronic version (pdf) of operating and maintenance manuals in English and French.
- .3            Provide spare parts, maintenance materials and special tools of same quality and manufacture as products provided in Work.
- .4            Provide evidence, if requested, for type, source and quality of products supplied.

**1.4                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.

## **1.5 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.

## **1.6 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.

## **1.7 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.

## **1.8 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.

## **1.9 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 Departmental representative 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.
  - .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
    - .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 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.

**1.10            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 Refer to demolition drawings and specifications for items to be salvaged for reuse.
- .3 Protect surrounding and circulation path.
- .4 Use saw cut around area to demolish
- .5 Remove items to be reused, store as directed by Departmental Representative, and re-install under appropriate section of specification.
- .6 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 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 mm<sup>2</sup>/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 41 00 – Precast structural concrete

**1.2               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.

**1.3               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.

#### **1.4 QUALITY ASSURANCE**

- .1 Submit in accordance with Section 01 45 00 - Quality Control and as described in PART 2 - SOURCE QUALITY CONTROL.
  - .1 Mill Test Report: upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel, minimum 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.

#### **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground, 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/m<sup>2</sup>.
  - .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 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. Ensure that casting is not interrupted to avoid joints.
- .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/m<sup>2</sup>, 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 –
  - .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 from MTQ standards , 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/m<sup>3</sup> 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

## **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 and walkway
  - .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.

### **3.4 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 and walkway repair, water curing is mandatory.

### **3.7 SEALING APPLICATION**

- .1 Apply sealant on non slippery surfaces complying with 3601 standard, VII Volume, ch. 3 – Concrete sealant. Ministère des transports du Québec. .

### **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 in designated area.
- .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 and 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                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,

## **Part 2            Products**

### **2.1                MATERIALS**

- .1      Cement to CAN/CSA-A3001, Type GU<sub>b</sub>-SF / GU<sub>b</sub>-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/m<sup>2</sup> 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 of Ministère des Transports standard, 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/m<sup>3</sup> (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.

### **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/m<sup>2</sup>, 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.
- .6 Bolts and anchor bolts: to ASTM A307.
- .7 Bolts : according to ASTM A325
- .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/m<sup>2</sup> 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**

- .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 The outer ladders must be galvanized after assembly.
- .5 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 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .3 Provide suitable means of anchorage acceptable to Departmental Representative such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.
- .4 Exposed fastening devices to match finish and be compatible with material through which they pass.
- .5 Supply components for work by other trades in accordance with shop drawings and schedule.
- .6 Make field connections with bolts to CSA S16.
- .7 Deliver items over for casting into concrete and building into masonry together with setting templates to appropriate location and construction personnel.
- .8 Touch-up rivets, field welds, bolts and burnt or scratched surfaces with primer after completion.
- .9 Install curbs, access bollards and rescue ladders where indicated and as shown in the plans

### **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                RELATED REQUIREMENTS**

- .1            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/m<sup>3</sup>);
  - .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/m<sup>3</sup>) and the corresponding requirement of the CAN/CSA O80 standard, Wood Preservation;
  - .11 The results of the penetration test (kg/m<sup>3</sup>) and the corresponding requirement of the CAN/CSA O80 standard, Wood Preservation;
  - .12 The storage or shipping point.
  - .13 Production lot is considered a certain quantity of timbers of same size and species that has been treated in same condition at same time.
- .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 standard.

### **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 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 MATERIALS**

- .1 Stone 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 : quarry run 300mm – 0mm
  - .1 The size grading of the stone must be distributed as:
    - .1 D85 : 250 mm
    - .2 D50 : 150 mm
    - .3 D15 : 50 mm
    - .4

### **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 Reinstate pavements [and sidewalks] disturbed by excavation to thickness, structure and elevation which existed before excavation.
- .3 Clean and reinstate areas affected by Work as directed by Departmental Representative.
- .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                RELATED REQUIREMENTS**

- .1        Section 05 50 00 – Metal fabrication
- .2        Section 06 05 73 – Wood treatment

**1.2                REFERENCES**

- .1        American Society for Testing and Materials International (ASTM)
  - .1        ASTM A307, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
  - .2        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, 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.

### **1.3 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

### **1.4 QUALITY ASSURANCE**

- .1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.
- .2 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .3 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.

### **1.5 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.

## **1.6 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:
  - .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. A maximum of 30% of no. 2 quality is accepted.
  - .3 Timbers has to be cut square in both ends before processing, according to the article 748 c) of the Standard Grading Rules for Canadian Lumber (precision cut).
  - .4 Length for main timber shall be 3660 mm (12ft)minimum.
  - .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 Bolts**

.1 Bolts according to A307 B heavy hex, galvanised.

**.2 Washers**

.1 For 305 X 305 : G40.21 300W or 350W steel galvanized, 10mm thick and 89mm of outer diameter and 28.5 inner diameter. Square washer plates are not accepted.

.2 For 254 x 254 : 75mm ext. diam. and 28.6 int. diam.

.3 Lag bolts to be used with ASTM A436 washer, both to be galvanized.

.4 Bolts and nuts : hot dip galvanized to 560g / m2 according to ASTM A153.

.5 Bars and plates hot dip galvanized to 525g /m2 according to ASTM A123.

**.2 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.

.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 Plan ahead delivery, unloading and storage in a way to ensure continuous supply to work site.

## **Part 3 Execution**

### **3.1 PREPARATION**

- .1 Before construction, stockpile sufficient ballast to completely fill cribs.
- .2 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 wharf face where mooring is present and where joints are found.
- .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 INSTALLATION**

- .1 These cribs will be completely filled right to the lower limit of the joists with ballast stone.
- .2 The Contractor shall notify the Departmental Representative fifteen (15) days before the expected date of immersing the cribs and they will not immersed unless the Departmental Representative gives a written approval.
- .3 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.
- .4 Install the joists with their camber facing upward.
- .5 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.
- .6 The construction and final assembly of the cribs as shown in the plans will continue once the cribs are placed in their final positions.
- .7 No permanent marks will be accepted or tolerated on the sections of the structure left exposed above level -2.0m (tidal level).
- .8 Assemble, anchor, attach, tie and brace the elements to make them strong and solid enough.

### **3.5 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.

### **3.6 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.

### **3.7 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.

### **3.8 CLEANING**

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

**END OF SECTION**

## **Part 1           General**

### **1.1           RELATED SECTIONS**

- .1       Section 35 31 25 – Placement of stone

### **1.2           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.

### **1.3           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.

### **1.4           SUBMITTALS**

- .1       The following information shall be submitted to the Departmental Representative.
  - .1       Stone source information:



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
- 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
- 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.
- 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
- The Contractor shall provide weigh scale operators and pay all costs involved.
- .5 Other weighing devices
- 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
- 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.

## 1.5 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).

## 1.6 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.

## **1.7 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 duties**

- .1 The supervisor is responsible for implementing all the elements in the control plan for stones. 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 Duties of Inspectors**

- .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.

## **1.8 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, 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).

## **1.9 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 .

## **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, seams 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 Amour Stone A-Class**

- .1 Conglomerate materials will NOT be acceptable as stone for this project, whatever the conformity of other specifications.
- .2 Is there an uncertainty for conglomerate 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 Embankment stones 300-500 kg
  - .2 Ballast stones. 400-500 kg

## **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 <sup>1</sup>	ASTM D4992-07	No conglomerate No deleterious materials; excellent quality for earmarked usage
Petrographic review <sup>2</sup>	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 <sup>3</sup>	ASTM C127-07	≤ 0.5%
Compression Strength <sup>4</sup>	ASTM D7012-07	≥ 100 MPa
Micro-Deval wear resistance <sup>5</sup>	ASTM D6928-06	≤ 15
MgSO integrity <sup>4</sup>	ASTM C88-05	≤ 1.5% loss after 5 cycles
Petrographic review <sup>2</sup>	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 MgSO<sub>4</sub> 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.

**END OF SECTION**



**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Section 35 31 24 – Stone production

**1.2                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            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.
- .4            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.

**1.3                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.

**1.4                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 NOT USED**

- .1 Not used.

## **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.
  - .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 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.

.3 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 Stones shall be placed individually as indicated sloped and drawings within 0.5m in X, Y Z directions.
- .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.

### **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 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.

**3.5 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.

**3.6 TURBIDITY CONTROL**

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

**3.7 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 In order to make the text lighter, we will use ACBM in these specifications.

### **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: 150 mm.
  - .2 Mats interconnexions available on 4 sides
  - .3 Stainless steel wire of grade 316 of 4.8mm diameter.
  - .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%
  - .7 Geotextile fabric of type II according to VII volume of MTQ Volume.

## **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 the seabed so they rest uniformly at the bottom without creating undesired artificial deformation and rise vertically to the surface of the cribs.
- .2 Secure the ACMBs to the dock following the method described in the plans and specifications
- .3 Then connect the ACMBs to each other with a sufficient number of connections, following the directives of the manufacturer
- .4 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                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.

**1.2                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.

**1.3                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 Material: 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: 4.5 kN-m
- .5 Maximum allowable reaction at minimum energy absorption capacity: 90 kN
- .6 To be 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.<sup>1</sup>

### **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.

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<sup>1</sup> <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**



QUEBEC REGION

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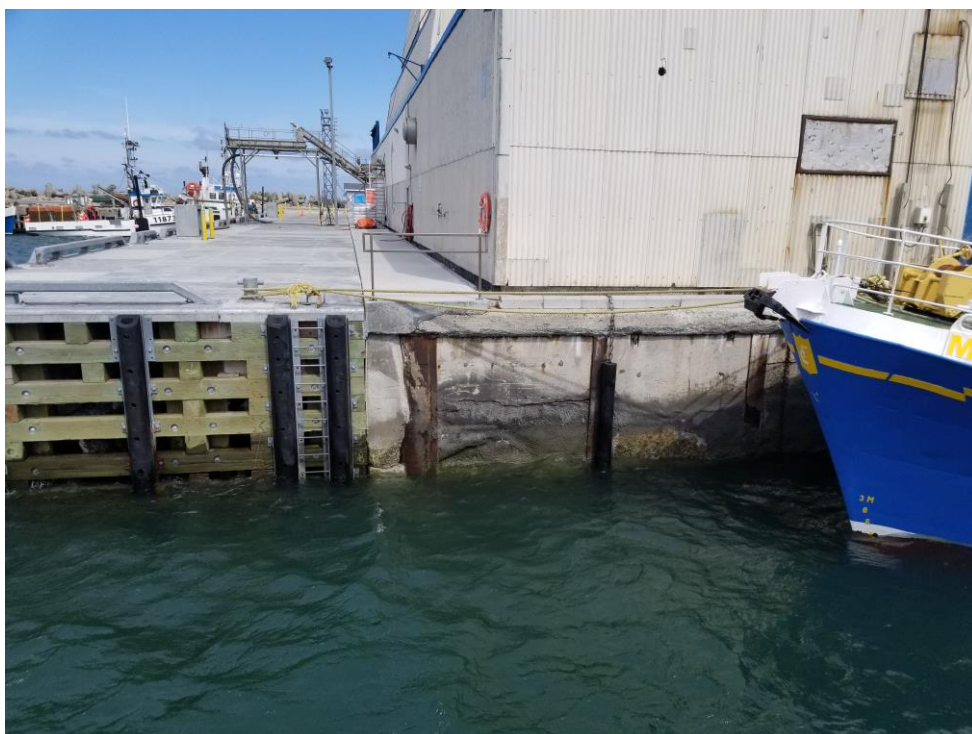
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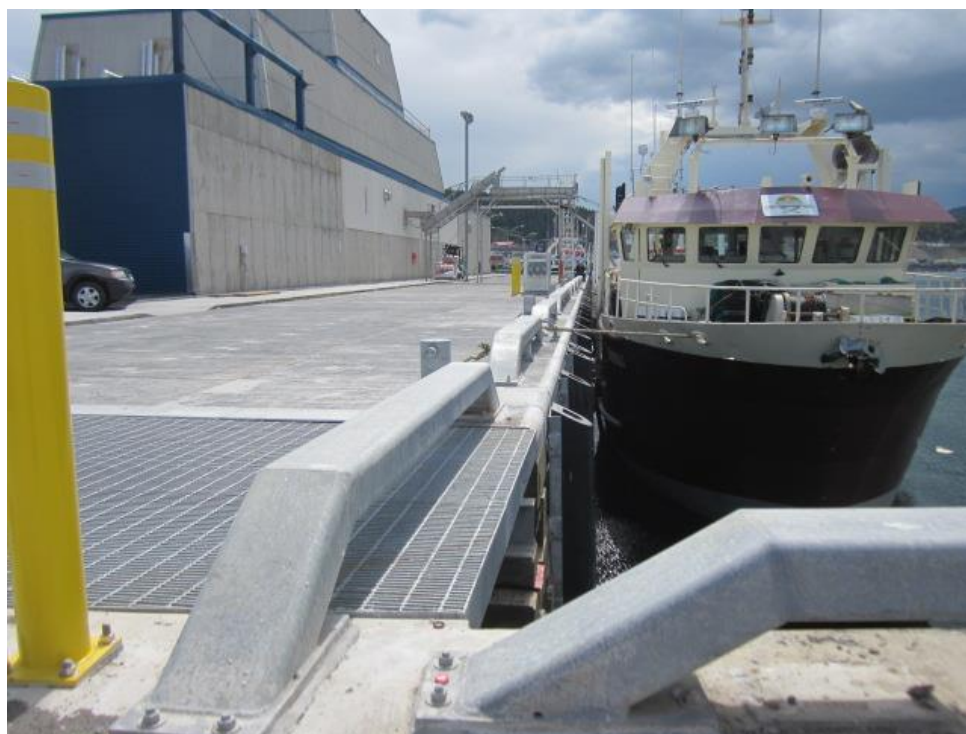
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