Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 05 50 00 – Metal fabrication

.2 Section 06 05 73 – Wood treatment

.3 Section 31 53 13.01 – Timber Cribwork

1.2 REFERENCES

.1 ASTM International

.1 ASTM A123/A123M-09, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.2 ASTM D1761-06, Standard Test Methods for Mechanical Fasteners in Wood.

.3 ASTM D5456-11, Standard Specification for Evaluation of Structural Composite Lumber Products.

.4 ASTM A307, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.5 ASTM A153, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware (Spécifications pour revêtements de zinc (galvanisé à chaud) sur la quincaillerie d'acier et de fer)

.6 ASTM D1761, Standard Test Methods for Mechanical Fasteners in Wood.

.7 ASTM F1667, Driven Fasteners: Nails, Spikes, and Staples

.8 ASTM F2329, Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners

.2 CSA International

.1 CSA O80 Series-15 Wood preservation

.2 CSA O121-08, Douglas Fir Plywood.

.3 CSA O151-09, Canadian Softwood Plywood.

.4 CSA O153-13 Poplar Plywood.

.5 CAN/CSA-Z809-2013, Sustainable Forest Management.

.3 Forest Stewardship Council (FSC)

.1 FSC-STD-01-001, FSC Principle and Criteria for Forest Stewardship.

.2 FSC-STD-20-002, Structure, content and local adaptation of Generic Forest Stewardship Standards

.4 National Lumber Grades Authority (NLGA)

.1 Standard Grading Rules for Canadian Lumber 2010.

.5 The Quebec Forest Industry Council (QFIC)

1.3 ACTION/INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for wood products and accessories and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

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

1.4 QUALITY ASSURANCE

.1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

.2 Plywood, particleboard, OSB and wood based composite panels in accordance with CSA and ANSI standards.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 A storage facility for treated wood and assembly and pre-assembly of cribs has been designated and shown in the plans.

.3 Storage and Handling Requirements:

.1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

1.6 MANAGEMENT AND DISPOSAL OF WASTE

.1 Develop a construction waste management plan for the work covered by this section and in accordance with Section 01 74 21 - Management and disposal of construction/demolition waste.

.2 Management of packaging waste: recover packaging waste for re-use/re-use and recovery of pallets, crates, quilting, other packaging materials by the manufacturer, following the guidelines of the waste management plan built in accordance with section 01 74 21 - Management and disposal of construction/demolition waste.

.3 Transport unused metal elements to a metal recycling facility approved by the Departmental Representative

1.7 MATERIALS SUPPLIED BY THE DEPARTMENT

.1 The list of processed timber supplied by the Department is in Appendix A.

.2 The list of nuts and bolts supplied by the Department is in Appendix B.

.3 All items must be provided by the Contractor, except for the elements found in Appendices A and B.

Part 2 Products

2.1 ELEMENTS FOR WOODEN CRIBS

.1 The quantities and lengths of timber provided by the Department for this project are listed in Appendix A. These quantities are listed by species requested in this specification. The table specifies the exact quantities and lengths of wood that were pre-cut before treatment.

.2 The pieces of wood supplied by the Department for the construction of the cribs are pre-cut before treatment according to the dimensions to be used as such for the project. The Contractor shall fully use all the parts supplied for the project and will be responsible for replacing broken parts, or those that are poorly cut or resulting from an error on his part.

.3 The details for specifications during pre-purchase of treated wood can be provided upon request to the Departmental Representative.

2.2 WOOD TREATMENT PRODUCT

.1 Preservatives used for the extreme treatment of timber must comply with CAN/CSA-080-M standards.

.2 All wood used in the construction of the cribs shall be treated with chromate copper arsenate (CCA), following CAN/CSA-080-M standards. The net retention and penetration should be 24 kg/m3 for all the parts.

.3 Any pressure treated material, requiring cutting or drilling to be adjusted, should be coated with three (3) layers of preservative while it is still dry, as required by CAN/CSA-080 standards. All holes in timbers shall be treated this way.

2.3 NUTS AND BOLTS

.1 The amounts and lengths of the nuts and bolts provided by the Department for this project are listed in Appendix B.

.2 The nuts and bolts provided by the Department for the construction of cribs are to be used as such for the project. The Contractor shall fully use all the parts supplied for the project and will be responsible for replacing broken parts, or those that are poorly cut or resulting from an error on his part.

.3 The details for specifications during pre-purchase of nuts and bolts can be provided upon request to the Departmental Representative.

2.4 ACCESSORIES

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

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions.

- .1 Visually inspect substrate in presence of Departmental Representative.
- .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 MATERIALS

.1 Base parts:

- .1 Base parts include the lower section of the crib. They will have 305 mm of rough trimming and will be placed longitudinally as required.
- .2 Longitudinal beams at the base will have free ends as shown in the plans.
- .3 They will be tied to each piece of wood they intersect, as shown in the plans.
- .4 The base parts will be tied to each vertical post they intersect with a mechanical bolt of 28.6 mm in diameter and of suitable length. Base parts shall be laid horizontally.

.2 Ballast platform

- .1 The ballast platform will consist of wooden logs of 275 mm in diameter, placed from top to bottom on the base parts. They will be of the required length and their joint will be placed on a base part, as shown in the plans.
- .2 A negative variation of 50mm in diameter on the length of the logs (7920mm) will be accepted.
- .3 The logs must be healthy and free from decay.
- .4 Treatment of logs is not required, either before or after the logging process.
- .5 The logs should be as straight as possible.
- .6 Gaps caused by the straightness of logs will be accepted but must not exceed 50 mm between each of the logs.
- .7 The logs will be placed on the first and only row of the base parts.
- .8 The logs of the ballast platform will be in SPF and will be strong enough to hold the pressure applied on it by ballast stone during immersion.
- .9 The Department encourages the recovery of scrap wood as a ballast platform, but it must be safe, clean and free of any form of contamination, creosote, paint, varnish, dirt and mud, and any other element such as nuts and bolts, etc. The source of the recovered timber could be investigated by the Departmental Representative, who reserves the right to reject. If the recovered wood is processed, it must comply with CAN/CSA-080 standards.

.10 The logs can be squared for proper installation, but the minimum diameter (225mm) must be respected.

.3 Longitudinal members:

.1 The longitudinal members will consist of parts of 305 mm squaring placed horizontally, as shown in the plans. The lengths are determined using butt joints indicated in the plans.

.2 The longitudinal members will be tied at each intersection with a cross member or a frontage piece with a drift pin of 32 mm in diameter and of suitable length. They will be tied to each vertical post they intersect with a mechanical bolt of 28.6 mm in diameter and of suitable length.

.4 Cross ties:

.1 The cross ties will consist of parts of 305mm squaring placed horizontally, as shown in the plans.

.2 The cross ties will have the same length throughout the project and will be tied to vertical posts with mechanical bolts of 28.6 mm in diameter and of suitable length.

.3 The cross ties will be tied at each intersection with a beam using a drift pin of 32 mm in diameter and of suitable length.

.4 Additional cross ties located under the joists and midway between the posts will be fixed by means of lost tip bolts.

.5 Frontage timber:

.1 They will consist of wooden parts with 305 mm squaring placed horizontally, as shown in the plans.

.2 They will be butt joined as indicated in the plans between the cross ties such that the joints are inverted from one row to another. Each joint will be supported by a wooden block with 305mm squaring, and with a length of 1200 mm and each end of the frontage timber will be tied to it, as shown in the plans.

.3 The frontage timber for the crib will be tied at each intersection with a cross tie, a longitudinal member, another frontage piece with a drift pin of 32 mm in diameter. The frontage timber will also be tied at each vertical crossing with a post using a mechanical bolt of 28.6 mm in diameter and of suitable length.

.4 The heads of the bolts, as well as the steel washers will be fully embedded, such that they are flush with the frontage timber along all the outer faces of the cribs, except the outer frontage (seaward) of the wooden cribs, between level -2.0m (tidal level) and the seabed.

.5 Holes reaming is also required in some places to ease the proper installation of wooden parts.

.6 Vertical posts:

.1 The vertical posts will consist of wooden parts with 305 mm squaring placed horizontally, as shown in the plans. No joints is allowed from below the base parts to the upper limit of joists.

.2 They will be tied at each intersection with a base part, cross tie, longitudinal member, frontage, crowning, with mechanical bolts 28.6 mm in diameter and of suitable length.

.7 Joists:

.1 Treated wooden joists with 305 mm squaring will be installed on the crib as shown in the plans.

.2 The beams will be placed as shown in the various figures of the plans. They will be tied to each cross tie with a beam using a drift pin of 32 mm in diameter and of suitable length.

.8 Plywood:

.1 Plywood of 1200x2400x19 mm will be placed across the entire outer frontage (land side) of each of the cribs in height from the seabed to below the concrete slab. They will be firmly tied to the dock, as shown in the plans and will serve as form work for the casting of concrete.

3.3 TREATMENT ON THE SITE

.1 This should be done in compliance with CAN/CSA-080 standards.

.2 Any pressure treated material, requiring cutting to be adjusted, should be coated with three (3) layers of preservative while it is still dry, as required by CAN/CSA-080 standards. The process will be completed by brushing to force the penetration of the product. All holes made in the timber after the pressure treatment, should also be treated this way.

.3 Discard any chemical deposits, treated pieces of wood to which a finishing product will be applied.

3.4 INSTALLATION

.1 Build cribs with CCA-treated wood with 305 mm x 305 mm, as shown in the plan.

.2 The pre-assembly of wooden cribs will be done in the boats wintering site , located close to the launch facilities for boats.

.3 Install square and plumb elements, depending on the prescribed heights, levels and alignments.

.4 Before sinking the cribs, the Contractor must already have had half the quantity of stones required to fill them and the cribs must be completely filled in less than one week. The Contractor shall provide and will have all the tools and equipment needed to keep the cribs in stable during immersion.

.5 These cribs will be completely filled right to the lower limit of the joists with ballast stone, as described in sections 35 31 24 - Production of stone, as indicated in the plans. The stone must be filled in the cribs so as not to damage them, nor the base of the cribs.

.6 The Contractor shall notify the Departmental Representative fifteen (15) days before the expected date of immersing the cribs and they will not immersed unless the Departmental Representative gives a written approval.

.7 If some cribs are not aligned after immersion, the Contractor shall remove ballast stone at his own expense until the cribs can come afloat, and he will put them in the right place.

.8 Install the joists with their camber facing upward.

.9 Carefully choose the structural elements that will be left exposed. Install the sawn lumber elements so as to disguise classification markings and deterioration, or remove by sanding the marks and traces of these exposed surfaces.

.10 The construction and final assembly of the cribs as shown in the plans will continue once the cribs are placed in their final positions.

.11 No permanent marks will be accepted or tolerated on the sections of the structure left exposed above level -2.0m (tidal level).

.12 Assemble, anchor, attach, tie and brace the elements to make them strong and solid enough.

3.5 CLEANING

.1 Clean all traces of temporary markings on the exposed sections of the structure.

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

.1 Leave Work area clean at end of each day.

.3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

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

3.6 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by rough carpentry installation.

END OF SECTION