

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 05 50 00 – Metal fabrication
- .2 Section 06 05 73 – Wood treatment
- .3 Section 06 10 00 – Rough carpentry
- .4 Section 31 36 19 – Gabion mattresses

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(R2002), Wood Preservation.
- .3 Canadian Wood Council
 - .1 Wood Design Manual - 2005.
- .4 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber 2003 edition.

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 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 Wooden cribs components
 - .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 required in 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 Wood treatment product
 - .1 See section 06 10 00 - Rough carpentry

- .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.
- .4 Accessories
 - .1 Nails, spikes and staples: in compliance with ASTM F1667, Driven Fasteners: Nails, Spikes, and Staples.
- .5 Stones
 - .1 Ballast stones: in conformity with section 35 31 24 - Stone production
 - .2 Crushed stones foundation: in conformity with Section 31 36 19 - Gabion Execution

Part 3 Execution

3.1 PREPARATION

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

3.2 APPLICATION

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

3.3 CRIB CONSTRUCTION

- .1 Precut and pre-bore timber prior to preservative treatment.

- .2 For the lag screws, bore guide holes with a diameter equivalent to 70% of the diameter of the stem of the lag. For drift pin, bore holes with the diameter of the type of hardware to be used, less than 1.0 mm than that of the latter. For mechanical bolts, bore holes with the same diameter as that of the bolts.
- .3 Construct timber cribwork to specified height prior to sinking in final position.
- .4 Ballast floor:
 - .1 Place ballast floor members on bottom timbers to their final position.
 - .2 Place ballast floor members horizontally.
 - .3 Secure pieces at intersections of bottom timbers and vertical posts, and other ballast floor members with drift pins.
- .5 Bottom timbers:
 - .1 Place the base members following the longitudinal direction so as to align with base of cribs.
 - .2 The length of base parts shall conform with the plans
 - .3 Vertically fasten the base parts to the cross members with drift pins at the location shown in the plans.
 - .4 Vertically attach the base parts to the second level of longitudinal members with bolts at location shown in the plans.
- .6 Longitudinal members
 - .1 Place longitudinal members to the centre of the joint piece of 1.2 m long.
 - .2 Attach all the longitudinal members to block pieces with bolts.
 - .3 Alternate beams joints such that the parts of two consecutive rows should not joint in the same cell or at the same post.
 - .4 At all levels, attach the longitudinal members to the cross ties using drift pin, and to the posts, using bolts as indicated in the plans.
 - .5 Attach the longitudinal members to cross ties with bolts as indicated in the plans.
 - .6 Ream the holes such that the bolt heads do not protrude over the entire outer face of each timber crib. Reaming holes is not required on the structures located within the cribs as well as on the outer surfaces (East side only) of the timber cribworks between level -2.0 m (tidal level) and the seabed.
 - .7 Reaming holes is also required in some places to ease the proper installation of wooden parts.
- .7 Cross ties: the cross ties in the cribs must be installed in one piece.
 - .1 At all levels, attach the cross ties to the longitudinal members using drift pins, and to the posts, using bolts as indicated in the plans.
 - .2 Attach the cross ties to the beams with carriage bolts as indicated in the plans.
- .8 Post: the post must be installed in one piece, from the bottom of the crib to the top and their lengths should be adjusted once the cribs are built to their final level.
- .9 The posts must be covered with a membrane piece folded 10mm on sides.

3.4 HANDLING TREATED TIMBER

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

3.5 TOLERANCES

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

3.6 CLEANING

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

END OF SECTION