

Part 1 General

1.1 DESCRIPTION

- .1 This section specifies requirements for the supply and installation of treated timber necessary for the fabrication, placing and ballasting of timber cribwork for the construction of a new marginal wharf.

1.2 RELATED SECTIONS

- .1 Section 01 35 29.06 - Health and Safety Requirements
- .2 Section 01 45 00 - Quality Control
- .3 Section 01 33 00 - Submittal Procedures
- .4 Section 06 05 73 – Wood Treatment.
- .5 Section 03 30 00 – Cast In Place Concrete.

1.3 MEASUREMENT FOR PAYMENT

- .1 Treated Timber Cribwork-(Supply and Install): to be measured in cubic metres (m³) of completed work which include excavation, ballast stone, treated timber, fastenings, and all plant, labour, materials and equipment to perform work. Include as incidental to this unit price the costs for excavation of cribseat and disposal of the excavated material at an approved landfill site.
- .2 Measure timber cribwork in cubic metres (m³) determined by product and use following dimensions measured in place:
 - .1 Height: average of measurements taken at each vertical from bottom of lowest timber to top side of uppermost course of timber.
 - .2 Width: average of 2 measurements between outside faces of exterior longitudinal timbers, each width measured on top ties of each row of cross ties.
 - .3 Length: measured horizontally along centre-line of crib between outside faces of exterior cross ties.
- .4 Measurements of the vertical lengths, widths and lengths of cribwork, will be taken in the presence of both the Contractor and the Departmental Representative and will be verified and signed by both parties on the site to avoid any disputes.

1.4 REFERENCES

- .1 American Society for Testing and Materials International (ASTM), latest edition
 - .1 ASTM A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - .2 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

- .2 American Wood-Preserver's Association (AWPA), latest edition
 - .1 AWPA M4, Standard for the Care of Preservation - Treated Wood Products.
- .3 Canadian Standards Association (CSA International), latest edition
 - .1 CSA B111, Wire Nails, Spikes and Staples.
 - .2 CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .3 CSA-O80 Series 08 Wood Preservation.
- .4 Canadian General Standards Board (CGSB), latest edition
 - .1 CAN/CGSB-8.1, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2, Sieves, Testing, Woven Wire, Metric.
- .5 Canadian Wood Council, latest edition
 - .1 Wood Design Manual.
- .6 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber latest edition.

1.5 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.

1.6 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 gloves, respirators, dust masks, long sleeved clothing, eye protection and protective clothing 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.

1.7 WASTE MANAGEMENT

- .1 Separate waste materials for reuse and recycling.

- .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 Timber: use timber graded and stamped in accordance with applicable grading rules and standards of associations or agencies approved to grade lumber by Canadian Lumber Standards Accreditation Board of CSA.
 - .1 Species: Douglas fir, Pacific Coast hemlock and Eastern Hemlock.
 - .2 Grade: No. 1 Structural.
 - .3 Grading authority: NLGA.
 - .4 Preservative treatment: To CSA 080 for coastal waters and section 06 05 73 Wood Treatment. Supply timber in lengths required. Cut and field treat field timbers only as may be necessary to suit site conditions. Contractor will have on site sufficient lengths and thickness of treated timber to permit levelling of cribs after ballasting operations.
- .2 Miscellaneous steel: Medium structural steel conforming to CSA Specification G40.21 "Structural Quality Steels".
 - .1 Wire nails, spikes, staples: to CSA-B111.
 - .2 Bolts, nuts, washers: to ASTM A307.
 - .3 Drift bolts: to G40.21 from round stock, button head and diamond or wedge point.
 - .4 Steel straps and plates: to CAN/CSA-G40.21.
 - .5 All hardware to be galvanized.
- .3 Ballast for filling cribs to following requirements:
 - .1 Stone, consisting of hard durable particles free from clay lumps, organic material and other deleterious materials.
 - .2 Dry density in place: minimum 2600 kg/m³.
 - .3 Gradation: To be well graded with maximum sizes not exceeding 400 mm on any side and minimum size of not less than 250 mm on any side.

Part 3 Execution

3.1 PREPARATION

- .1 Prepare area of crib base to elevations indicated on drawings or to bedrock. Excavated material from under the cribwork is to be disposed of at an approved landfill site.
- .2 Contractor to confirm with Departmental Representative that excavated cribseat is adequate for cribwork placement.
- .3 Before construction, stockpile sufficient ballast to completely fill cribs. Provide suitable plant and equipment to keep cribs in proper position and alignment during sinking operations.
- .4 Take closely spaced accurate soundings, precisely located by template, to surface of mattress, to determine actual configuration of base area of crib.
 - .1 Construct crib bottom to match base configuration.
- .5 Cribs out of alignment or not correctly located to be refloated and replaced in correct position.

3.2 CRIB CONSTRUCTION

- .1 Precut timber prior to preservative treatment. Construct timber cribwork to 400 mm above LNT prior to sinking in final position in work.
- .2 Drift Bolts: length of drift bolts equal to thickness of timbers fastened less 50 mm, unless otherwise specified. Bore holes for drift bolts 2 mm smaller diameter than bolt and for full length of bolt.
- .3 Machine Bolts: length of machine bolts equal to thickness of timbers fastened plus thickness of washers plus 40 mm. Where bolts are countersunk, the length, as noted above, less depth of countersink. Thread machine bolts for 64 mm. Bore holes for machine bolts to same diameter as bolts.
- .4 Levelling pieces:
 - .1 Place timber levelling pieces beneath bottom timbers to conform to shape of base area.
 - .2 Place levelling pieces horizontally.
 - .3 Secure succeeding pieces at intersections of bottom timbers and vertical posts, and other levelling pieces with machine bolts.
- .5 Bottom timbers:
 - .1 Place bottom timbers lengthwise, and crosswise to form bottom three courses of cribs.
 - .2 Crosswise bottom timbers to be of one piece.
 - .3 Lengthwise bottom timbers to be one piece.
 - .4 Secure three courses of bottom timbers together with machine bolts at every intersection with each other and with vertical posts.
- .6 Ballast floor:

- .1 Place ballast floor on pockets on bottom or middle course of bottom timbers.
- .2 Secure each ballast floor timber to bottom timbers with drift bolts such that adjacent ballast floor timbers are not secured to the same bottom timber.
- .7 Longitudinals :
 - .1 Butt join exterior and interior longitudinals in centre of 1.2 m block.
 - .2 Secure block to lower timber with drift bolt at centre and secure longitudinals and splice at ends to block with drift bolts.
 - .3 Longitudinals to be of sufficient length to span entire length of crib.
 - .4 Stagger joints in longitudinal timbers: do not join in same bay or on same vertical post.
 - .5 Secure longitudinals to intersection of cross ties with drift bolt and to intersection of vertical posts with machine bolt every third course of longitudinals along with the top course.
 - .6 Countersink machine bolts on exterior face above LNT.
 - .7 Where cribs are married together longitudinals to be sufficient length to span a minimum of half a bay of one crib and one and a half bays of the adjacent crib.
- .8 Cross ties: one length across cribs.
 - .1 Secure cross ties to intersection of longitudinals with drift bolt and to intersection of vertical posts with machine bolt every third course of cross tie, along with the top course.
 - .2 One row of crossties and verticals may be eliminated from one crib where cribs marry together above +400 mm LNT.
- .9 Vertical posts: one length from bottom of cribwork to top of cribwork. Locate one vertical post at corner of each crib and at intersection of crossties with longitudinals.
- .10 Filler Blocking: place filler timber as indicated on drawings.
 - .1 Cut blocking exact length to completely fill spaces and such that the total thickness of crossties and longitudinals carrying the bearing weight of the deck be a minimum of 600 mm if cribwork ends on a crosstie.
 - .2 If cribwork ends on a longitudinal one additional tier of blocking is required.
 - .3 Blocking of same material as crossties or longitudinals and fastened with 2 drift bolts into timber immediately below it.
- .11 Levelling: treated timber required for levelling of cribwork after ballasting, must be full width continuous over entire length to be levelled.

3.3 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 Ripping of treated timber not permitted without prior approval of Departmental Representative.

3.4 BALLAST

- .1 Place ballast to avoid damage to timber cribwork.
- .2 Place ballast so that differential height of fill between adjacent cells, at any time, will be less than 1 m.
- .3 Pockets of cribs ballasted within 100mm of top of crib timbers.

3.5 GRAVEL

- .1 Install a 100mm layer of gravel over the top of ballast to form a base for the reinforced concrete deck.
- .2 Hand place final items of ballast stone to fill voids and depressions to hold gravel in place.
- .3 Install gravel to grade required and compact in preparation for concrete deck work.
- .4 Clean any loose gravel from timber surfaces prior to placement of concrete deck.

3.6 TOLERANCES

- .1 1 in 300 in overall dimensions.
- .2 Locate cribs within 100 mm of location as indicated. Horizontal misalignment within 100 mm along the outside faces.
- .3 Spaces between ballasted cribs within 200 mm. No payment for this space will be made above or below LNT.

3.7 PROTECTION

- .1 Protect work from damage resulting from work on other sections and from damage resulting from environmental conditions.
- .2 Repair or replace portion or entire crib at no additional cost if damaged by work.

END OF SECTION