

PART 1 - GENERAL

1.1 DESCRIPTION

- .1 This section specifies requirements for supply and installation of structural timber as follows:
 - .1 Supply and installation of treated coping dimension timber wheelguard, wheelguard blocking, wales, fender supports, bracing, blocking and associated painting.
 - .2 Supply and installation of untreated dimension hardwood timber horizontal and vertical fenders.
 - .3 Supply and installation of untreated timber hardwood ladders, ladder handgrips, and associated hardware and painting.

1.2 RELATED WORK

- .1 Section 02 41 16 - Sitework, Demolition and Removal.
- .2 Section 03 30 00 - Cast-in-Place Concrete.
- .3 Section 06 05 73 - Wood Treatment.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM International)
 - .1 ASTM A307-12, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile.
 - .2 ASTM-A123/A123M-13, Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.
 - .3 ASTM F1667-13, Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.
- .2 American Wood-Preserver's Association (AWPA)
 - .1 AWPA M4-11, Standard for the Care of Preservation - Treated Wood Products.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
 - .2 CAN/CSA-G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Steel.
 - .3 CAN/CSA-O80 Series-08 (R2012), Wood Preservation.
- .4 Canadian Wood Council
 - .1 Wood Design Manual.
- .5 National Lumber Grades Authority (NLGA)

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- 1.3 REFERENCES (Cont'd)
- .5 (Cont'd)
- .1 Standard Grading Rules for Canadian Lumber 2014 edition.
- 1.4 DIMENSIONS
- .1 Check existing site dimensions and report discrepancies to Departmental Representative before commencing work.
- 1.5 PROTECTION
- .1 Avoid dropping, bruising or breaking of wood fibres.
- .2 Avoid breaking surfaces of treated timber.
- .3 Do not damage surfaces of treated timber by boring holes or driving nails or spikes into them to support temporary material or staging.
- .4 Treat cuts, breaks or abrasions on surfaces of treated timber with 3 brush coats of preservative to CSA 080.
- .5 Treat bolt holes, cutoffs and field cuts in accordance with CSA 080.
- 1.6 DELIVERY AND STORAGE
- .1 Store timber horizontally, evenly supported and open piled permit circulation when stored for prolonged period.
- .2 When handling long timber, provide support at sufficient number of points, properly located to prevent damage due to excessive bending.
- .3 Handle treated timber with hemp, manila or sisal rope slings or other approved means of support that will not damage surface.
- .4 Do not use sharp pointed tools to handle treated timber. Any timber so handled will be rejected and be replaced at Contractor's expense.
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1.7 MEASUREMENT FOR
PAYMENT

- .1 Treated Dimension (Supply and Install):
- .1 Treated Dimension Timber: The supply and installation of treated dimension timber for coping, wheelguard, wheelguard blocking, cross bracing, wales, bracing and blocking, will be measured by the cubic metre (m³) of timber secured in place, including all timber, fastenings, plant, material, equipment, labour, wheelguard bolt hole leveling sealant, painting of wheelguard and wheelguard blocking.
- .2 Untreated Dimension Hardwood Timber: The supply and installation of untreated dimension hardwood timber for vertical hardwood fenders, and horizontal fenders as specified will be measured by the cubic metre (m³) of timber secured in place including all timber, fastenings, plant, material, equipment, and labour.
- .3 Ladders - (Untreated): The supply and installation of untreated ladders as a unit will be measured by the unit secured in place. Contractor will provide all timber, fastenings, plant, material, equipment, and labour, including untreated timber hardwood ladder uprights, ladder rungs, ladder handgrips, and painting of ladder uprights.
- .2 Payment for all dimension timber will be made on volume calculated from nominal sizes as indicated on drawing and specified, eg. 200mm x 200mm.

PART 2 - PRODUCTS

2.1 TIMBER
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 Administration Board of CSA.
- .2 Species
- .1 Wheelguard, wheelguard blocks, coping, cross bracing and wales: Hemlock or Douglas Fir (CCA or ACA treated).
- .2 Hardwood fenders and ladder uprights: Birch or Maple untreated).
- .3 Grade: No. 1 Structural Grade
- .4 Grading Authority: NLGA

2.1 TIMBER
MATERIALS
(Cont'd)

- .5 Preservative Treatment: Treat to CSA 080, for coastal waters and Section 06 05 73 - Wood Treatment. Timbers will be treated in the lengths required. Unnecessary field cutting will not be permitted.
- .6 Primer: Alkyd undercoat, exterior oil wood primer, similar to Pittsburgh 6-9, 6-809 or approved equal.
- .7 Paint: Alkyd/Oil Resin paint similar to Pittsburgh Paints "Safety Yellow" Product ID 7-808C, "Safety Orange" Product ID 7-805C. Paint to conform to CAN/CGSB-1.61-2004, TT-E-489, TT-E-505.
- .8 Wheelguard and wheelguard blocking to be painted "safety orange". Ladder uprights to be painted "safety yellow".

2.2 MISCELLANEOUS
STEEL AND
FASTENINGS

- .1 Miscellaneous Steel: All steel and fastenings to be CSA G40.21, Grade 300 W, galvanized.
 - .2 Nails and Spikes: to CSA B111 or ASTM F1667.
 - .3 Machine Bolts and Nuts: to ASTM A307. All machine bolts and nuts to be galvanized.
 - .4 Drift Bolts: to G40.21 from round stock button head and diamond or wedge point. All drift bolts to be galvanized.
 - .5 Washers:
 - .1 Round Plate Washers: for 16 mm machine bolts will be 76 mm diameter by 6.4 mm thick, for 19 mm machine bolts will be 79 mm diameter by 7.9 mm thick and have a hole diameter of 18 mm and 21 mm diameter respectively. Washers to conform to G40.21. All washers to be galvanized.
 - .2 Round plate washers for 25 mm dia. machine bolts, 89 mm diameter by 7.9 mm thick and have a hole diameter of 28 mm. Washer to G40.21.
 - .3 Plain Washers: to CSA B19.1, Class 2. All washers to be galvanized.
 - .4 Square washers are not permitted.
 - .6 Galvanizing: will conform to ASTM A123/A123M. Unless otherwise specified, minimum weight of zinc coating will be as stated in this standard. Fabricator is to adhere to recommendations of standard.
 - .7 Ladder Rungs and Hand Grips: to CSA G40.21, galvanized.
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- 2.2 MISCELLANEOUS STEEL AND FASTENINGS
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- .8 Lag Screws: to CSA B34, galvanized lag screw washers will conform to CSA B19.1
 - .9 Welding in accordance with CSA Standards. The welders will be qualified to the appropriate classification as stated in CSA W47.1 "Certification of Companies for Fusion Welding of Steel Structures." Conform welding to all appropriate requirements and recommendations of CSA Standard W59 "Welded Steel Construction" (metal arc welding).

- 2.3 ANCHOR BOLTING SYSTEM
- .1 Anchor bolts, where required, for anchoring coping and/or wheelguard to existing concrete deck will be 19mm diameter resin cartridge anchors.
 - .2 Submit shop drawings and manufacturer's specification for anchor bolts for approval.
 - .3 Anchor bolts to be installed with strict adherence to manufacture specifications.

PART 3 - EXECUTION

- 3.1 PREPARATION
- .1 Install structural timbers to details shown on drawings or as specified.

- 3.2 WHEELGUARD AND WHEELGUARD BLOCKING
- .1 Wheelguard timbers to be 200 mm x 200 mm and will be in minimum lengths of 6100 mm or as specially required with butt joints made over wheelguard blocking. Wheelguard timbers to be chamfered on top, 25 mm on each horizontal and vertical surface.
 - .2 Wheelguard blocks will be installed at 1500 mm on centre or as required to support the wheelguard.
 - .3 Wheelguard will be secured through wheelguard blocking, coping and two (2) crib timbers below with two (2) 25 mm diameter drift bolts as shown on detail drawings.
 - .4 Wheelguard to be secured to coping and blocking at pile wharf with 25 mm dia. x 750 mm long galv. machine bolts c/w galv. washers and nuts.

3.2 WHEELGUARD AND
WHEELGUARD BLOCKING
(Cont'd)

- .5 Countersink drift bolts and machine bolt heads with a minimum distance from face of timber to the head of the bolt is 12 mm. Fill the void flush to timber with self-levelling sealant: single compound, self-levelling, premium grade polyurethane sealant with an accelerated curing capacity.
- .6 The installation of wheelguard and wheelguard blocking as per detail.

3.3 WALES

- .1 Supply and install 200 mm x 200 mm treated timber fender supports in minimum length of 7620 mm around perimeter of wharf as directed.
- .2 Secure 200 mm x 200 mm wale supports to timber piles with 25 mm diameter galvanized bolts c/w galv. nuts and washers as required.

3.4 FENDERS

- .1 Horizontal Fenders:
 - .1 Install hardwood timber fenders in minimum length of 4880 mm along top perimeter of wharf. Stagger joints in coping from joints in horizontal fender.
 - .2 Top horizontal fender to be chamfered 25 mm on top seaward face.
 - .3 Secure horizontal fender to coping with 16 mm x 200 mm mechanical anchors, minimum of four (4) each mechanical anchors per fender, spaced at 1500 mm on centre. All anchors to be countersunk on the exterior face.
- .2 Vertical Fenders:
 - .1 Install hardwood timber fenders spaced at 300 mm on centre along face of wharf.
 - .2 Secure each fender with four (4) each 16 mm diameter lag screws evenly spaced from LNT to underside of horizontal fender. All lag screws to be countersunk.
 - .3 All fenders to extend from underside of horizontal fender to 300 mm below LNT.
 - .4 Do not notch or cut fenders to provide straight wharf face. Continuous blocking will be installed behind fenders and chocks to provide straight face.

3.5 CROSS BRACING

- .1 Supply and install 100 mm x 150 mm treated timber cross bracing between piles. Length as required.

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- 3.5 CROSS BRACING .2 Secure cross bracing to wood piles with 19 mm dia. galvanized machine bolts c/w galvanized nuts and washers. Lengths as required.
(Cont'd)
- 3.6 WOOD BEAMS .1 Supply and install 300 mm x 200 mm treated timber beam supporting ballast floor at timber pile wharf. Length as required. Fasten beam as per details on accompanying drawings. Fasteners as detailed.
- .2 Supply and install 200 mm x 200 mm support beams at 3.0 m o/c supporting 150 mm x 200 mm beams that are spaced at 610 mm c/c which support 200 mm thick concrete deck. See details on accompanying drawings. Fasteners as shown on details.
- 3.7 BLOCKING .1 Supply and install 300 mm x 250 mm treated timber side support blocks at new wood pile locations. Attach with 25 mm dia. galv. machine bolt c/w galv. nuts and washers as detailed on drawings.
- 3.8 LADDERS .1 Install ladders on face of wharf in locations shown on drawings or designated by Departmental Representative.
- .2 Ladder uprights to be 2-150 mm x 200 mm installed from 900 mm below LNT to wheelguard elevation. Uprights to be bevelled at 45° on top and painted as specified.
- .3 Construction details and steel handgrips as per detail.
- .4 Secure each upright with four (4) each evenly spaced 19 mm diameter galvanized lag screws. All lag screws to be countersunk.
- 3.9 PAINTING .1 Paint four (4) sides of wheelguard, exposed sides of wheelguard blocking, tops of fenders, and complete ladder uprights including notches and countersink holes as directed by the Departmental Representative.
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3.9 PAINTING
(Cont'd)

- .2 Use one (1) coat of exterior oil wood primer and two (2) coats of alkyd/oil resin paint as specified. Paint materials for each coat to be product of a single manufacturer as specified. Ensure previous coat of primer or paint is dry before second coat is applied.

3.10 BOLT SIZING

- .1 Drift Bolts: Drift bolts used in the work will have a length equal to thickness of timbers being fastened less 50 mm unless otherwise specified. Holes for drift bolts will be bored 2 mm smaller diameter than size of steel used and for full length of bolts.
- .2 Machine Bolts: Machine bolts used in work will have a length equal to thickness of timbers being fastened plus thickness of washers plus 40 mm. Where bolts are countersunk, the length will be as above less depth of countersinking. Machine bolts will be threaded for 64 mm. Holes will be drilled same diameter as bolt.
- .3 Lag Screws: All lag screws used in the work will have a length equal to thickness of timbers being fastened less 50 mm and depth of countersinking. Holes for lag screws to be drilled same diameter as shank portion of screw and to inside thread diameter for threaded portion of screw and for full length. All lag screws will be countersunk, screwed, not driven in place, and will have one (1) standard washer under the head.
- .4 Countersink drift bolts and/or lag screws in hardwood fenders, chocks and ladders, to the extent that the minimum distance from face of timber to head of bolt is 12 mm.
- .5 Bolting of timbers without properly drilled bolt holes will not be accepted.

3.11 INFILLING

- .1 Install treated structural timber full length sections in areas as indicated on drawings or as indicated by Departmental Representative.
- .2 Cut and remove damaged, split, rotten, loose timber as indicated on drawings or as indicated by Departmental Representative.

3.11 INFILLING
(Cont'd)

- .3 Secure treated structural timber infill with drift bolts, lag screws, and spikes as required, shown on drawings or as indicated by Departmental Representative.
- .4 All splicing, leveling, blocking and infilling to be approved by Departmental Representative prior to installation of new fendering.