

	STRUCTURAL TIMBER	Section 31 53 16
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Harbour Development		
Prosser Rock, St. John's, NL		2019-01-01

## PART 1 - GENERAL

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| <u>1.1 DESCRIPTION</u>  | <p>.1 This section specifies requirements for supply and installation of structural timber as follows (note that where Canada supplied timber does not complete the work as shown on the drawings, the Contractor will be responsible for supplying and installing the additional timber):</p> <p>.1 Installation of untreated dimension hardwood timber fenders.</p> <p>.2 Installation of untreated timber hardwood ladders, ladder handgrips, and associated painting and hardware.</p>  |
| <u>1.2 RELATED WORK</u> | <p>.1 Section 02 41 16 - Sitework, Demolition and Removal.</p> <p>.2 Section 03 30 00 - Cast-in-Place Concrete.</p> <p>.3 Section 31 53 13 - Timber Cribwork.</p>   |
| <u>1.3 REFERENCES</u>   | <p>.1 American Society for Testing and Materials (ASTM International)</p> <p>.1 ASTM A307-07b, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile.</p> <p>.2 Canadian Standards Association (CSA International)</p> <p>.1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.</p> <p>.2 CAN/CSA-G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Steel.</p> <p>.3 CAN/CSA G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.</p> <p>.3 Canadian Wood Council</p> <p>.1 Wood Design Manual.</p> <p>.4 National Lumber Grades Authority (NLGA)</p> <p>.1 Standard Grading Rules for Canadian Lumber 2000 edition.</p> |

<u>1.4 DIMENSIONS</u>	.1	Check existing site dimensions and report discrepancies to Departmental Representative before commencing work.
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<u>1.5 PROTECTION</u>	.1	Avoid dropping, bruising or breaking of wood fibres.
	.2	Do not damage surfaces of treated timber by boring holes or driving nails or spikes into them to support temporary material or staging.

<u>1.6 DELIVERY AND STORAGE</u>	.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.

<u>1.7 MEASUREMENT FOR PAYMENT</u>	.1	<u>Structural Timber:</u>
	.1	<u>Untreated Dimension Timber:</u> The installation of untreated dimension hardwood timber for hardwood fenders, and ladders as specified will be measured by the cubic metre (m <sup>3</sup> ) of timber secured in place including all timber, fastenings, plant, material, equipment, and labour, ladder rungs, wheelguard hand grips, and painting of complete ladder uprights.
	.2	The supply and installation of the fire

separator will not be measured separately for payment. Include the costs in the lump sum arrangement.

- .2 Payment for all dimension timber will be made on volume calculated from nominal sizes as indicated on drawing and specified, eg. 200 mm x 200 mm.
- .3 Blocking for pipe discharge sleeves, as noted on the drawings, will not be measured separately for payment, and is to be included incidental to treated timber cribwork.

## 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 Hardwood fenders and ladder uprights: Birch or Maple (untreated).
- .3 Grade: No. 1 Structural Grade
- .4 Grading Authority: NLGA
- .5 Preservative Treatment: Treat to CSA 080, for coastal waters and Section 06 05 73. Timbers will be treated in the lengths required. Unnecessary field cutting will not be permitted.
- .6 Primer: Alkyd undercoat, exterior oil wood primer.
- .7 Paint: Alkyd/Oil Resin paint to conform to CAN/CGSB-1.61-2004.

## 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.
- .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 Plain Washers: to CSA B19.1, Class 2. All washers to be galvanized.
  - .3 Square washers are not permitted.
- .6 Galvanizing: will conform to CSA G164 "Hot Dip Galvanizing of Irregularly Shaped Articles." Unless otherwise specified, minimum weight of zinc coating will be as stated in Table 1 of this standard. Fabricator is to adhere to recommendations of Appendix A and Appendix B of standard.
- .7 Ladder Rungs and Hand Grips: to CSA G40.21, galvanized.
- .8 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).

### PART 3 - EXECUTION

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

3.2 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 double horizontal fenders as noted on the drawings.  
.2 Vertical Fenders:  
.1 Install hardwood timber fenders spaced at 300 mm on centre along face of wharf except for exterior corners where fenders will be closed face for 1500 mm as directed.  
.2 Secure each fender as noted on the drawings. All lag screws and bolts 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 to provide straight face.

3.3 LADDERS .1 Install ladders on face of wharf in locations shown on drawings or designated by Departmental Representative.  
.2 Ladder uprights to be 150 mm x 200 mm and installed from 1100 mm below LNT to wheelguard elevation. Uprights to be bevelled at 45° on top and complete ladder upright to be painted.  
.3 Construction details and steel handgrips as per detail.

.4 Secure each upright as noted on the drawings.

#### 3.4 PAINTING

.1 Paint complete ladder uprights (safety yellow) as directed by the Departmental Representative.

.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.

#### 3.5 BOLT SIZING

.1 Drift Bolts: Drift bolts used in the work are calculated as 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 are calculated as 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 lag screws in hardwood fenders and ladders to the extent that the minimum distance from face of timber to head of bolt

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is 12 mm.

- .5 Bolting of timbers without properly drilled bolt holes will not be accepted.

- 3.6 FIRE SEPARATOR .1 Install fire separators as shown on the drawings.