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 dimension timber wheelguard, wheelguard blocking, coping and associated painting.
.2 Supply and installation of untreated dimension hardwood timber fenders.
.3 Supply and installation of untreated timber hardwood ladders, ladder handgrips, and associated 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.

.4 Section 31 53 13 - Timber Cribwork.

1.3 REFERENCES

.1 American Society for Testing and Materials (ASTM International)
.1 ASTM A307-07b, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile.

.2 American Wood-Preserver's Association (AWPA)
.1 AWPA M4-06, 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 G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
.4 CAN/CSA-O80 Series-97 (R2007), Wood Preservation.

.4 Canadian Wood Council
.1 Wood Design Manual.

.5 National Lumber Grades Authority (NLGA)
.1 Standard Grading Rules for Canadian Lumber 2000 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.

1.7 MEASUREMENT FOR PAYMENT

.1 Structural Timber:

.1 Treated Dimension Timber: The supply and installation of treated dimension timber for wheelguard, wheelguard blocking and will be measured by the cubic metre (m^3) 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 hardwood fenders, as specified will be measured by the cubic metre (m^3) of timber secured in place including all timber, fastenings, plant, material, equipment, and labour, and painting of tops of fenders.

.3 Ladders - (Untreated): The supply and installation of untreated ladders 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 all sides 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 and cribwork timbers: 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

.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, similar to Pittsburgh 6-9.

.7 Paint: Alkyd/Oil Resin paint similar to Pittsburgh Paints "Safety Yellow" Product ID 7-808. 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 300W, 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 16mm machine bolts will be 76mm diameter by 6.4mm thick, for 19mm machine bolts will be 79mm diameter by 7.9mm thick and have a hole diameter of 18mm and 21mm 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).

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 200mm x 200mm and will be in minimum lengths of 6100mm or as specially required with butt joints made over wheelguard blocking. Wheelguard timbers to be chamfered on top, 25mm on each horizontal and vertical surface.

.2 Wheelguard blocks will be installed at 1500mm on centre as support for wheelguard.

.3 Wheelguard will be secured through wheelguard blocking, coping and two (2) crib timbers below with two (2) 25mm diameter drift bolts as shown on detail drawings.

.4 The installation of wheelguard and wheelguard blocking as per detail.

3.3 COPING

.1 Install 200mm x 250mm treated timber coping in minimum length of 7620mm around perimeter of wharf as directed.

.2 Secure coping to new concrete deck as indicated. All bolts to be countersunk on the exterior face. All countersinking to be drilled.

.3 Secure coping to timber below with 19mm diameter drift bolts spaced at 1500mm on centre.

3.4 FENDERS

.1 Horizontal Fenders:

.1 Install hardwood timber fenders in minimum length of 4880mm along top perimeter of wharf as indicated. Stagger joints in coping from joints in horizontal fender.

.2 Top horizontal fender to be chamfered 25mm on top seaward face.

.3 Secure horizontal fender to coping with 16mm diameter lag screws, minimum of four (4) each drift bolts per fender, spaced at 1500mm on centre. All lag screws to be countersunk on the exterior face.

.2 Vertical Fenders:
.1 Install hardwood timber fenders spaced at 300mm on centre along face of wharf except where fenders will be closed faced for 1500mm as directed.
.2 Secure each fender with four (4) each 16mm 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 300mm below LNT except at all span locations where fenders extend from underside of horizontal fender to 600mm 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.
.5 Fenders to be supplied in dimensions 100mm x 150mm.

3.5 LADDERS

.1 Install ladders on face of wharf in locations shown on drawings.

.2 Ladder uprights to be 150mm x 200mm in size and installed from 900mm below LNT to wheelguard elevation. Uprights to be beveled 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 19mm diameter galvanized lag screws. All lag screws to be countersunk.

3.6 PAINTING

.1 Paint wheelguard, wheelguard blocking, and complete ladder uprights 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.

3.7 BOLT SIZING

.1 Drift Bolts: Drift bolts used in the work will have a length equal to thickness of timbers being fastened less 50mm unless otherwise specified. Holes for drift bolts will be bored 2mm 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 40mm. Where bolts are countersunk, the length will be as above less depth of countersinking. Machine bolts will be threaded for 64mm. 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 50mm 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, and ladders, to the extent that the minimum distance from face of timber to head of bolt is 12mm.

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