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PART 1 - GENERAL

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| 1.1 | <u>Related Work</u>        | .1 | Refer to other Specification Sections for related information.  |
|     |                            | .2 | Refer to <b>Section 01 33 00</b> for Shop Drawing/Submissions requirements.   |
| 1.2 | <u>Reference Standards</u> | .1 | CAN/CSA 080 Series 15 (or latest edition)- Wood Preservation.   |
|     |                            | .2 | Copper naphthenate containing 2% copper for Brush or Spray Treatment for Field Cuts.  |
|     |                            | .3 | NLGA standard grading rules for Canadian Lumber 2017 edition or most recent edition at time of tendering.   |
|     |                            | .4 | CSA B111-1974(R2003) (or latest edition), Wire Nails, Spikes and Staples  |
|     |                            | .5 | CSA 086-14 (or latest edition), Engineering Design in Wood.   |
|     |                            | .6 | ASTM A123/A123M-17 (or latest edition), Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.   |
|     |                            | .7 | ASTM D4637/D4637M-15 (or latest edition), Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane.   |
|     |                            | .8 | ASTM F3125/F3125M-15a (or latest edition), Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions. |
|     |                            | .9 | ASTM F593-17 (or latest edition), Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.  |
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- 1.3 Submissions
- .1 At least two weeks prior to finalizing timber order, submit drawings, clearly indicating installation details. Show splice locations, splice details, fastening arrangements.
  - .2 Submit methodology for field treatment.
  - .3 Provide submissions in accordance with **Section 01 33 00.**
- 1.4 Measurement for Payment
- .1 Timber will be measured in accordance with **Section 01 29 00.**

PART 2 - PRODUCTS

- 2.1 Materials
- .1 Softwood Timber: Graded and stamped to National Lumber Grading Authority (NLGA) No. 1 Structural. Eastern Hemlock, Western Hemlock or Douglas Fir Species, only, will be used.
  - .2 Hardwood Timber: Sound merchantable grade yellow birch, hard maple, red or white oak conforming to grading rules approved by the National Hardwood Lumber Association.
  - .3 Timber Treatment:
    - .1 Preservative treatment to CSA 080 - Series - 15 for Marine Construction Coastal Waters. Where assay retentions are not indicated, they are to be taken as 1.5 times the indicated gauge retention.
    - .2 Make arrangements for testing of timber by:
      - .1 Plant Inspection: Provide treatment plant identification, date of treatment, list of various pieces in the charge, charge number, plant assay testing results, concentration and type of preservative used, duration of
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- treatment, gauge retention, species of wood; and make arrangements with the treatment plant to locate bundles, move bundles, break open bundles and carry out other measures to facilitate the inspection.
- .2 Filling in and submitting a preprinted form, agreed to by the *Departmental Representative*, containing the above information.
- .4 Miscellaneous Hardware: Hardware must meet the following specifications:
- .1 Machine bolts, lag bolts, drift bolts, anchor bolts, nuts, round plate washers: to ASTM F3125/F3125M, Grade A325.
- .2 Spikes: to CSA B111.
- .3 Hot dip galvanized hardware, bolts, nuts, washers and spikes to ASTM A123/A123M, with minimum zinc coating of 600 g/m<sup>2</sup>.
- .4 Screws: to ASTM F593.
- .5 All hardware will be galvanized unless otherwise shown on plans.

### PART 3 - EXECUTION

#### 3.1 General

- .1 Supply and install dimension timbers to reinstate the portion of existing wharf removed for the construction of Berlin wall. This shall include installation of new timber piles, pile caps, stringers and deck, etc. all as required for complete reinstatement of existing wharf. Treated timber to be supplied in pre-cut lengths to suit. Submit shop drawings and details of wharf reinstatement prior to proceeding with work.
- .2 Boreholes for drift bolts to be 1.5 mm smaller in diameter than bolt and for full length of bolt. Boreholes for machine bolts to be same diameter as bolts. Boreholes for lag bolts to be same diameter as shank for
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- unthreaded portion and 0.70 times the shank diameter for the threaded portion. Threaded portion of lag bolts will be installed using a wrench, not by driving.
- .3 All countersunk holes to be recessed 25 mm and shall receive two coats of Copper naphthenate, allowing sufficient time between applications to permit total absorption. The cost of supply and application of Copper naphthenate will not be measured for payment but will be considered incidental to the work.
- 3.2 Handling Timber .1 Timber will be protected during handling, shipping, offloading and field handling, by use of suitable equipment and procedures. Use rope or fabric strap slings on site for moving bundles or individual timbers, rather than metal grabs, chains or cables.
- .2 Tops of vertical untreated timber to be field treated with minimum two liberal coats of Copper naphthenate.
- 3.3 Handling Treated Timber .1 Handle treated material to avoid damage causing alteration in original treatment.
- .2 Treat in field, spike holes, boreholes, plugged holes, cuts and any damage to treated material, using Copper naphthenate, as specified herein, regardless of plant treatment type. Fill all unused bored holes and any other holes with tight fitting treated wooden plugs prior to any exposure to water containing marine borers.
- .3 Provide methodology pertaining to heating and application. Apply to dry surfaces, wherever possible.
- .4 Treat boreholes, using a pressurized container with an extension rod, to produce a fine spray in the holes with one
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application. Alternately a cylindrical brush may be used.

- .5 Treat field cuts and any abrasions with minimum of two liberal applications, using either spray or brush.
- .6 In addition, field cuts and underwater damaged areas will receive a coating of plastic compound, capped with lead flashing secured with galvanized roofing nails. Plastic compound not to be water soluble and is subject to approval.
- .7 Environmental Concern: Ensure no spillage or excess application of field preservative. Provide workmen with sufficient training and protective gear to properly and safely handle the treated materials and to apply field treatment, so as to prevent undue hazard to themselves, others, or the environment.
- .8 **Contain all debris and leachates (films on water surface) within the area of the work by using containment facilities such as floating booms or screens.**

#### 3.4 Deck Plank

- .1 Install decking in accordance with CSA 086 in the same pattern as existing on the existing timber wharf.
  - .2 Attach decking to each stringer with 250 mm galvanized spikes. Use one spike per timber per support excepting as follows:
    - .1 Two at ends of splice
    - .2 Two at ends of timber
    - .3 Two per timber per support for timbers wider than 150 mm.
  - .3 Predrill holes to receive deck spikes.
  - .4 Joints: splice only over centre line of stringer and only one per wharf width. Splices shall be staggered on each stringer
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and shall be minimum 4 deck planks apart.  
Minimum length of timbers: 2400 mm.

- .5 Maintain 12 mm spacing between each course of plank decking.
  - .6 Note: Prior to placing deck planks, cover tops of supporting timbers with 1.14 mm (0.045 inches) thick non-reinforced EPDM membrane conforming with ASTM D4637. This membrane is for the purpose of shedding water and is to be 50 mm wider on each side than the member covered. For example, use 250 mm wide sheet for a 150 mm wide member. Cost is incidental.
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