

PART 1 - GENERAL

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| <u>1.1 DESCRIPTION</u> | .1 This section specifies requirements for the supply and installation of treated timber piles. |
| <u>1.2 RELATED REQUIREMENTS</u> | .1 Section 01 33 00 - Submittal Procedures.
.2 Section 01 74 19 - Waste Management and Disposal.
.3 Section 06 05 77 - Wood Treatment.
.4 Section 31 09 16.01 - Pile Driving Templates. |
| <u>1.3 MEASUREMENT FOR PAYMENT</u> | .1 <u>Timber Piles (12.2 m long (40 ft))</u> : Supply and installation of timber piles to be measured by each driven in place. Contractor to provide all shoes, cap plates, straps and preservative treatment incidental to the supply of piles including plant and labour for installation.
.2 <u>Timber Piles (13.7 m long (45 ft))</u> : Supply and installation of timber piles to be measured by each driven in place. Contractor to provide all shoes, cap plates, straps and preservative treatment incidental to the supply of piles including plant and labour for installation.
.3 <u>Timber Piles (15.2 m long (50 ft))</u> : Supply and installation of timber piles to be measured by each driven in place. Contractor to provide all shoes, cap plates, straps and preservative treatment incidental to supply of piles including plant and labour for installation.
.4 <u>Timber Fender Piles (12.2 m long (40 ft))</u> : Supply and installation of fender timber piles to be measured by each driven in place. Contractor to provide all shoes, machine bolts, fastenings and presentation treatment incidental to the supply of piles including plant and labour for installation.
.5 Mobilization of equipment paid as fixed price item.
.6 Departmental Representative will establish actual number of piles installed from driving records. |

1.4 REFERENCE
STANDARDS

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A 123/A 123M-[02], Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM A 153/A 153M-[05], Standard Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware.
 - .3 ASTM A 307-[04], Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile.
 - .4 ASTM D 25-[99(2005)], Standard Specification for Round Timber Piles.
- .2 American Wood-Preservers' Association (AWPA)
 - .1 AWPA C1-[03], All Timber Products - Preservative Treatment by Pressure Processes.
 - .2 AWPA C3-[03], Piles - Preservative Treatment by Pressure Processes.
 - .3 AWPA M4-[02], Standard for the Care of Preservative-Treated Wood Products.
 - .4 AWPA M6-[01], Brands Used in Forest Products.
- .3 CSA Group (CSA)
 - .1 CSA B111-[1974(R2003)], Wire Nails, Spikes and Staples.
 - .2 CAN/CSA-G164-[M92(R2003)], Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CAN3-056-[M79(R2006)], Round Wood Piles (Metric version).
 - .4 CSA-O80 Series-[97(R2002)], Wood Preservation.
 - .1 CSA-O80.18-[97(R2002)], Pressure Treated Piles and Timbers in Marine Construction.

1.5 ACTION AND
INFORMATIONAL
SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Product Data: submit manufacturer's printed product literature, specifications and datasheet.
 - .3 Submit method of planned pile protection to Departmental Representative for review, as specified.
 - .4 Spliced piles: when authorized, submit design details of splice complete with signature and stamp of qualified professional engineer registered or licensed in the Province of Newfoundland and Labrador, Canada.
 - .5 Equipment Review and Drawings: submit prior to
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1.5 ACTION AND
INFORMATIONAL
SUBMITTALS
(Cont'd)

- .5 (Cont'd)
- .1 Submit complete list of the equipment proposed for use, including a description of the characteristics of each piece of driving equipment for review and approval by Departmental Representative.
- .1 The project Engineer will review the proposed driving equipment, accessories, and methods of adequacy for the conditions expected to be encountered. However, the adequacy of the equipment and accessories shall remain the responsibility of the Contractor. Should the equipment used by the Contractor prove inadequate to drive the schedule types of piles in the locations indicated, or should the use rate of accessories show damage to the piles, or should the Progress Schedule not be maintained, the Contractor shall replace, or use different types of equipment.
- .2 Submit shop drawings of driving accessories showing compatibility with the size configuration, handling, and driving requirements of each type of pile indicated on the Contract drawings.
- .6 Quality assurance submittals:
- .1 Test reports: submit 3 copies of inspection reports for piles from approved independent testing laboratories, indicating compliance in accordance with applicable AWPA Standards.
- .2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .7 Submit data on round timber pile treatment data, including certification by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained, and compliance with applicable standards.

1.6 WASTE
MANAGEMENT AND
DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.
- .2 Place materials defined as hazardous or toxic in designated containers.
- .3 Ensure emptied containers are sealed and stored safely.

1.6 WASTE
MANAGEMENT AND
DISPOSAL
(Cont'd)

- .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 sanitary landfill as approved by Departmental Representative.
- .7 Dispose of unused wood preservative material at official hazardous material collections site.
- .8 Do not dispose of unused preservative material into sewer system, into streams, lakes, onto ground or in other location where they will pose health or environmental hazard.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Pile branding: brand treated piles to indicate producer, in accordance with AWPA M6.
- .2 Round wood Class A timber piles: to CSA-056-10, ASTM D 25, having a minimum butt size of 330 mm and a 180 mm tip diameter related to length as indicated in table A-1 of CAN3-056.
 - .1 Order length of piles as indicated.
- .3 Round wood Class B fender piles: to CSA- having a minimum butt size of 280 mm and a 150 mm tip diameter related to length as indicated in table A-1 of CAN3-056.
- .4 Type of peeling: Machine peel.
- .5 Pile species: Red pine/southern yellow pine.
- .6 Pile caps and brace timbers: as indicated pressure treated in accordance with Section 06 05 73 - Wood Treatment.
- .7 Piles one piece, splices not permitted.
- .8 Splices permitted with approval of Departmental Representative.
 - .1 Submit detail for review.
- .9 Departmental Representative will be sole judge of quality and dimension of piles.

- 2.2 EQUIPMENT .1 Pile hammer: select and use pile hammer of sufficient weight and energy to suitably install specified pile without damage into soils expected to be encountered.
- 2.3 PRESERVATIVE TREATMENT .1 Preservative Treatment: to CSA-O80 Series, CSA-O80.18.
- 2.4 PILE SHOES .1 Point type specially fabricated for purpose and product of manufacturer regularly engaged in manufacture of pile fittings.
- .2 Provide size to fit tip.
- .3 Fabricate boot-type as detailed on drawings.
- .4 Fabricate point type of 5 mm steel plates, fully welded and sized to adequately cover full pointed area of pile. Provide each plate with 12 mm holes.
- 2.5 ACCESSORIES .1 Wire nails, spikes, staples: to CSA B111.
- .2 Bolts, nuts and washers: to ASTM A 307.
- .3 Hot dip galvanize bolts, nuts and washers and unless otherwise specified, staples, cable clamps, pipe sleeves, spikes and nails: to CAN/CSA-G164 and ASTM A 153/A 153M.
- .1 Other hardware to be galvanized to ASTM A 123/A 123M.

PART 3 - EXECUTION

- 3.1 MANUFACTURER'S INSTRUCTIONS .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.
- 3.2 PROTECTION .1 Avoid dropping, bruising or breaking of wood fibres.
- .2 Avoid breaking surfaces of treated piles.

3.2 PROTECTION
(Cont'd)

- .3 Do not damage surfaces of treated piles below cutoff elevation.
- .4 Treat cuts, breaks or abrasions on surfaces of treated piles, bolt holes and field cuts in accordance with CSA-080 Series.

3.3 WOOD
PRESERVATION

- .1 Treat wood piles with wood preservative treatment in accordance with Section 06 05 73 - Wood Treatment.

3.4 PREPARATION

- .1 Select piles in each group for uniformity of size and straightness to facilitate placing of brace timbers.
- .2 Submit details of proposed method of pile head and tip protection during driving to Departmental Representative for review and approval.
- .3 Protect piles by steel straps at not more than 3 m intervals along length of pile, with at least two straps placed within 500 mm of butt of each pile.
 - .1 Steel strapping and clip joints to develop tensile strength of at least 22 kN and to approval of Departmental Representative.

3.5 INSTALLATION

- .1 Restrain lateral movement of piling, during driving at intervals not exceeding 6 m over length between ground surface and driving head.
- .2 Treat exposed ends of cut off piles with two liberally brushed coats of wood treatment allowing sufficient interval between applications to permit total absorption.
- .3 Install metal pile coverings, where indicated, on tops of piles immediately after treatment; bend edges down over sides of pile, neatly trim and fasten with 8 large headed roofing nails.
- .4 Protection: treat end cut-offs and bolt holes with preservative.

3.5 INSTALLATION
(Cont'd)

- .5 Contractor shall maintain a pile driving record during pile driving and submit it to the Departmental Representative upon completion of pile driving. On the record indicate for each wooden pile driven, the driving sequence number, size of pile, length of pile, overall blow counts per 300 mm, number of blows per 25 mm penetration for at least 300 mm, conditions encountered during pile driving, equipment used, including type, rating, time and dates of all pile driving.
- .6 For this project the driving resistance has been identified by the number of blows required for the last 25 mm of pile penetration achieved with an impact hammer delivering 20 kN meters (15,000 ft lb) of energy.
 - .1 The final number of blows per 25 mm of pile penetration for the crib/deck supporting timber piles will be between 3 and 5.
 - .2 The final number of blows per 25 mm of pile penetration for the fender piles will be between 2 and 3.
 - .3 Deviation from the blow counts identified above may be required to suit existing field conditions. Any changes will have to be confirmed by the design engineer before work can proceed.

3.6 BRACING

- .1 Install bracing as indicated.

3.7 APPLICATION /
DRIVING

- .1 Place cap and cushion block combination capable of protecting pile head between top of pile and ram to prevent impact damage to pile.
- .2 Replace block if it is damaged, split, highly compressed, charred or burned or has become spongy or deteriorated, with a new block.

3.8 JETTING OF
PILES

- .1 Jetting will not be permitted.

3.9 TOLERANCES IN
DRIVING

- .1 Variation of not more than 6 mm per 300 mm of pile length from vertical for plumb piles or more than 13 mm per 300 mm of pile length from required angle for fender piles permitted.

3.9 TOLERANCES IN
DRIVING
(Cont'd)

- .2 Center of butts: within 100 mm of location indicated.
- .3 Manipulation of piles: not be permitted.
- .4 Drive piles min 3 meters of penetration.
- .5 Redesign of cribs or additional work required due to improper location of piles is responsibility of Contractor as reviewed by Departmental Representative.
- .6 Redrive heaved piles to required tip elevation.
- .7 Remove and replace damage piles, mislocated piles, driven out of alignment piles and provide additional piles, driven as directed.

3.10 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.