

PART 1 - GENERAL

1.1 RELATED  
SECTIONS

- .1 Section 31 62 19 -Timber Piles.

1.2 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 Spliced piles are not permitted.

1.3 DELIVERY,  
STORAGE AND  
HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's instructions.
- .2 Protect piles from damage due to excessive bending stresses, impact, abrasion or other causes during delivery, storage and handling.
- .3 Piles damaged by the contractor will be replaced as directed by the Departmental Representative at contractor's cost.

1.4 EXISTING  
CONDITIONS

- .1 Sub-surface investigation report is available for viewing at PWGSC office 4th floor Unit 100, 1045 Main Street, Moncton, N.B., during the following business hours: 8:30 to 12:00 noon and from 13:00 to 16:00, Monday to Friday. Contact the Department Representative.
  - .2 Any information pertaining to soils and all borehole logs are furnished by the Departmental Representative as a matter of general information only. Borehole descriptions shown on the logs are only descriptive of conditions at locations described by the boreholes themselves.
  - .3 The Contractor must make his own evaluation of soil conditions.
-

- 1.5 SCHEDULING .1 Provide schedule of planned sequence of driving to Departmental Representative for review, not less than two weeks prior to commencement of pile driving.

PART 2 - PRODUCTS

- 2.1 MATERIALS .1 Timber Piles as indicated on drawings are already supplied and are stored on site at Petit Cap, NB. Provide equipment to handle full length piles without cutting and splicing. Handling, transportation from the storage site to the construction site is part of this Work.

- 2.2 EQUIPMENT .1 Prior to pile installation, submit to Departmental Representative for review, details of equipment for installation of piles.
- .1 Impact hammers: provide manufacturer's name, type, rated energy per blow at normal working rate, mass of striking parts of hammer, mass of driving cap and type and elastic properties of hammer and pile cushions.
  - .2 Non-impact methods of installation such as augering, jacking, vibratory hammers or other means: provide full details of characteristics necessary to evaluate performance.
- .2 Hammer:
- .1 Hammer to weigh between 800 - 1000kg and be capable of developing a maximum rated energy of 62.5 N-m/sq.cm. and a minimum of 42.5 N-m/sq.cm.
  - .2 When required criteria can not be achieved with the proposed hammer, use larger hammer and take other measures as required.
-

### PART 3 - EXECUTION

- 3.1 PREPARATION .1 Protection:
- .1 Protect adjacent structures, services and work of other sections from hazards due to pile driving operations.
  - .2 Arrange sequencing of pile driving operations and methods to avoid damages to adjacent existing structures.
  - .3 When damages occur, remedy damaged items to restore to original or better condition at own expense.
- .2 Ensure that structures and ground conditions at pile locations are adequate to support pile driving operation.
- .1 Make provision for access and support of piling equipment during performance of Work.
  - .2 Contractor to assess state of access structure(s) for load carrying capability.
- 3.2 INSTALLATION .1 Leads: construct pile driver leads to provide free movement of hammer.
- .1 Hold leads in position at top and bottom, with guys, stiff braces, or other means to ensure support to pile while being driven.
  - .2 Length: except for piles driven through water, provide sufficient length of leads to ensure that use of follower is unnecessary.
  - .3 Swing leads:
    - .1 Obtain approval from Departmental Representative prior to using swing leads.
    - .2 Firmly guy top and bottom to hold pile in position during driving operation.
- .2 Installation of each pile will be subject to review of Departmental Representative.
- .1 Departmental Representative will be sole judge of acceptability of each pile with respect to final driving resistance, depth of penetration or other criteria used to determine load capacity.
  - .2 Departmental Representative to review final driving of all piles prior to cutting and removal of pile driving rig from site.

3.2 INSTALLATION  
(Cont'd)

- .3 Drive each timber pile to practical refusal to surface of bedrock.
  - .1 Do not overdrive to cause damage to piles in bedrock.
  - .2 Departmental Representative will determine refusal criteria for piles driven to rock based on type of pile and driving equipment.

3.3 APPLICATION /  
DRIVING

- .1 Use driving caps and cushions to protect piles.
  - .1 Reinforce pile heads as required by Departmental Representative.
  - .2 Piles with damaged heads as determined by Departmental Representative will be rejected.
- .2 Hold piles securely and accurately in position while driving.
- .3 Deliver hammer blows along axis of pile.
- .4 Restrike already driven piles lifted during driving of adjacent piles to assure set.
- .5 Cut off piles neatly and squarely at elevations as indicated on drawings.
  - .1 Provide sufficient length above cut-off elevation so that part damaged during driving is cut off.
- .6 Remove cut-off lengths from site on completion of work.

3.4 Field  
Measurements

- .1 Maintain accurate and daily records of driving for each pile, including:
  - .1 Type and make of hammer, rated energy, observed stroke, and observed number of blows per minute.
  - .2 Other installation equipment including details on use of pile cushion, follower, etc.
  - .3 Pile size and length, location of pile in pile group, and location or designation of pile group.
  - .4 Time for start and finish of driving pile and sequence of pile driving for piles in group.
  - .5 Penetration for own weight and weight of hammer, number of blows per meter for entire

3.4 Field  
Measurements  
(Cont'd)

- .1 (Cont'd)
- .5 (Cont'd)  
length of pile and numbers of blows per 25mm  
for the last 200 mm.
- .6 Toe elevation upon termination of  
driving pile and final toe and cutoff  
elevations upon completion of pile group.
- .7 Records of restriking.
- .8 Other pertinent information, such as  
interruption of continuous driving, observed  
pile damage, etc.
- .9 Records of elevations of adjacent piles  
before and after driving of pile.
- .10 Record all information on forms provided  
by Departmental Representative.

3.5 Final  
Penetration  
Resistance

- .1 Installation of each pile will be subject to  
approval of Departmental Representative, who  
will be sole judge of acceptability of pile  
with respect to final penetration resistance,  
depth of penetration, or other criteria.  
Departmental Representative to approve final  
penetration resistance of all piles prior to  
removal of pile driving equipment from site.
- .2 Each pile shall be installed as shown. Do not  
overdrive to cause damage to piles.
- .3 Departmental Representative will determine  
refusal criteria for piles.
  - .1 Timber Piles: Refusal may be taken as 10  
blows per 25 mm of pile penetration when  
driven using a hammer with a maximum rated  
driving energy in the order of 62.5 N-m/sq.cm  
of the pile tip area.
  - .2 Piles to be re-tapped 24 hours after  
driving with same driving criteria.

3.6 OBSTRUCTIONS

- .1 Where obstruction is encountered that causes  
sudden unexpected change in penetration  
resistance or deviation from specified  
tolerances, proceed as directed by  
Departmental Representative.

- |                               |    |                                                                                                                                  |
|-------------------------------|----|----------------------------------------------------------------------------------------------------------------------------------|
| 3.7 REPAIR AND<br>RESTORATION | .1 | Pull out rejected piles and replace with new piles.                                                                              |
|                               | .2 | No extra compensation will be made for removing and replacing or other work made necessary through rejection of defective piles. |

PART 1 - GENERAL

1.1 RELATED  
SECTIONS

- .1 Section 31 61 13 - Pile Foundation, General Requirements.

1.2 MEASUREMENT  
PROCEDURES

- .1 Consider shoes (20 units supplied by owner), cap plates, straps, cut off, preservative treatment and all hardware incidental to installation of piles.
- .2 The installation of Treated Wood bearing piles (vertical and batter piles) acceptably driven and secured in the work will be measured by the unit.
- .3 Timber Piles are supplied by owner and are stored at Petit Cap, NB. Handling, transportation of piles from the storage site to the construction site is part of this Work. Cleaning and reinstatement of storage site and disposal of debris/tarps will be considered incidental to the work.
- .4 Mobilization of equipment will be considered incidental to this item.
- .5 Extra piling to replace damaged piles by contractor will be considered incidental to the work and will not be measured for payment.
- .6 Consider CCA preservative treatment CAN/CSA080.18 to treat cuts incidental to the supply of timber piles.

1.3 REFERENCES

- .1 Canadian Standards Association (CSA International)
  - .1 CAN3-056-M79 (R2001), Round Wood Piles (Metric version).
  - .2 CSA 080 Series-97 Series-97(R2002), Wood Preservation.
    - .1 CSA-080.18-97(R2002), Pressure Treated Piles and Timbers in Marine Construction.

1.4 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 Spliced piles are not permitted.
- .4 Equipment: submit prior to pile installation for review by Engineer, list and details of equipment for use in installation of piles.

1.5 WASTE  
MANAGEMENT AND  
DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .2 Do not dispose of preservative treated wood through incineration.
  - .3 Do not dispose of preservative treated wood with other materials destined for recycling or reuse.
  - .4 Dispose of treated wood, end pieces, wood scraps and sawdust at sanitary landfill as approved by Engineer.
  - .5 Dispose of unused wood preservative material at official hazardous material collections site.
  - .6 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 The Treated Round timber piles (CCA treated), 300 mm minimum butt size, are supplied by owner and are as follows:
    - .1 to CAN3-056, with tip diameter related to length as indicated in table A-1 of 056-1962 (R2001).
    - .2 Refer to drawing M2 of M7 for number and length.
  - .2 Pile species: Red Pine.
  - .3 Pressure treated in accordance with Section 06 05 73 - Wood Treatment.
- 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 as indicated. Refer to section 31 61 13 for proposed hammer rated energy.
- 2.3 PRESERVATIVE TREATMENT
- .1 Preservative Treatment: to CSA-O80.18.
- 2.4 PILE SHOES
- .1 Provide size to fit tip indicated.
  - .2 Fabricate point type of 6 mm steel plates, fully welded and sized to adequately cover full pointed area of pile. Provide each plate with 4 nail hole.
- 2.5 ACCESSORIES
- .1 Wire nails, spikes, staples: to CSA B111-1974 (R1998).
  - .2 Bolts, nuts and washers: to ASTM A 307-02.
-

### PART 3 - EXECUTION

- |                                        |    |                                                                                                                                                                                           |
|----------------------------------------|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>3.1 MANUFACTURER'S INSTRUCTIONS</u> | .1 | Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets. |
| <u>3.2 PROTECTION</u>                  | .1 | Avoid dropping, bruising or breaking of wood fibres.                                                                                                                                      |
|                                        | .2 | Avoid breaking surfaces of treated piles.                                                                                                                                                 |
|                                        | .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-97 Series.                                                      |
| <u>3.3 PREPARATION</u>                 | .1 | Select piles in each bent 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 Engineer for review.                                                                                  |
| <u>3.4 INSTALLATION</u>                | .1 | Install piles in accordance with Section 31 61 13 - Pile Foundations, General Requirements.                                                                                               |
|                                        | .2 | Restrain lateral movement of piling, during driving at intervals not exceeding 6 m over length between ground surface and driving head.                                                   |
|                                        | .3 | Treat exposed ends of cut off piles with two liberally brushed coats of CCA product allowing sufficient interval between applications to permit total absorption.                         |
|                                        | .4 | Protection: treat end cut-offs and bolt holes with preservative.                                                                                                                          |

- 
- 3.5 BRACING .1 Install bracing as indicated.
- 3.6 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.
- 3.7 TOLERANCES IN DRIVING .1 Center of butts: within 50 mm of location indicated.
- .2 Manipulation of piles: not be permitted.
- .3 Remove and replace damage piles, mislocated piles, driven out of alignment piles and provide additional piles, driven as directed.
- 3.8 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.