

ITEM 10594.9503 M - TIMBER BULKHEAD

DESCRIPTION:

Work under this item shall include the installation of treated timber piles, sheet piling, wales, deadman piles and miscellaneous dimension timber necessary for a completed structure where shown on the contract plans.

The work under this item shall also include furnishing and installing a geotextile fabric backing on the timber sheet piling and all hardware including tie-rods, machine bolts, lag screws, turnbuckles, nails, spikes and other incidental metals necessary for a completed structure.

MATERIALS:

All timber used in the construction of the new bulkhead shall be Southern Yellow Pine Dense Structural Grade 65 and shall be in conformance with the requirements of Subsection 712-14. The provisions of Subsection 720-02 for the treated timber piles shall apply.

All timber in the bulkhead construction shall be treated with Chromated Copper Arsenate to a retention of no less than 40 kg per cubic meter as specified by the current American Wood Preservers Association Standard No. C18 for "Standard of Pressure Treated Piles and Timbers in Marine Construction".

The engineer reserves the right to inspect all new timbers and piles at the manufacturer's plant before shipment. Upon arrival at the site, the timber and piles will be inspected by the engineer and any timber and piles which do not comply with the specifications will be rejected and shall be removed from the site by the contractor.

The contractor shall furnish certification for all timber, providing information on stress grades and preservative treatment, subject to the approval of the engineer.

Unless otherwise specified, dimension timber for sheeting, wales and planks shall be cut square and surfaced on four sides and shall not be smaller in any dimension affected by the surfacing than shown on the contract plans.

Pile butts shall be sawed square and the tips shall be sawed square or tapered to a point not less than 100 mm in diameter. Piles shall be cut above the ground swell and shall have a uniform taper from butt to tip. A line from the center of the butt to the center of the tip shall not fall outside the center of the pile at any point more than 1% of the length of the pile. All knots shall be trimmed off flush with the body of the pile. Piles with sufficient checks to cause weakness will be rejected.

The minimum diameter of the piles shall be 305 mm at a section one meter from the butt, measured under the bark. The minimum diameter of the pile tips shall be 150 mm, measured under the bark. Piles shall have at least 38 mm of sapwood and their diameters shall not exceed 400 mm at the butt.

Deadman piles shall have a minimum diameter of 305 mm measured under the bark.

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Structural steel for tie-rods shall conform to the requirements of ASTM A36 M covering shapes, plates and bars of structural quality. Tie-rods shall be completely galvanized conforming to the requirements of Type I for Subsection 719 - 01. The weight of zinc coating per square meter of actual surface shall average not less than 610 grams.

Machine bolts, drift pins, dowels, nuts, washers, turnbuckles, lag screws, nails and spikes shall be in accordance with the requirements of ASTM 307 and shall be galvanized conforming to the requirements of Type II for Subsection 719 -01. The weight of zinc coating per square meter of actual surface shall average not less than 610 grams.

The geotextile fabric shall conform to the requirements of Subsection 207-2.

The premoulded resilient joint filler shall conform to the requirements of Subsection 705-07.

The contractor shall submit certifications on all materials to be used in this item.

CONSTRUCTION DETAILS:

The proposed bulkhead shall be installed where shown on the contract plans.

The requirements of Subsection 594-3 for the treated timber; piles, deadman piles, sheet piles and wales, shall apply.

Water jets shall be used to drive the timber piles and timber sheet piling down for the full length shown on the contract plans. Full length piles shall be used and no splicing will be permitted. The contractor shall order piles of such lengths as he may determine to satisfy the requirements stated herein.

Timber piles and sheet piles may be driven with power or gravity hammers. If the contractor elects to use power or gravity hammers the following shall apply:

Resistance to penetration shall not exceed (30) blows per 300 mm.

The heads of all timber piles and sheet piling shall be protected during driving by caps of approved designs. When the area of any timber pile is greater than that of the face of the hammer, a suitable cap shall be provided to distribute the blow of the hammer throughout the cross-section of the pile and thus avoid, as far as possible, the tendency to spilt or shatter the pile. Collars or bands shall be provided where necessary to protect the timber piles against brooming and splitting.

The procedure used in driving the piles and sheet piling shall not subject the timber pile to excessive and undue abuse producing splitting, splintering or brooming of the piles. Any pile broken or damaged by reason of internal defects, improper driving, driven out of its proper location or from any cause whatsoever shall be removed and replaced with a new pile at the expense of the contractor.

All piles and sheet piling pushed up by the driving of adjacent piles or by any other cause shall

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be re-driven as required.

Where the new sheet piles come in contact with the existing bulkhead or in any situation where an open joint would result from the trimming of timbers, pre-molded resilient joint material shall be used to form a tight seal.

Bolt holes shall be treated with creosote oil by means of an approved device which will apply the creosote oil to the inside of the hole. Any unfilled holes shall be treated with creosote oil and shall be plugged with creosoted plugs.

Holes for round drift-bolts, dowels and tie-rods shall be bored with a bit 1.5 mm larger than the diameter of the bolt, dowel or drift-bolt. Drift-bolts shall be equal to the least dimension of the dowel or bolt.

Holes for machine bolts shall be bored with a bit of the same diameter as the bolt. Holes for lag screws shall be bored with a bit not larger than the body of the screw at the base of the thread.

A galvanized steel plate washer shall be used under all bolt heads and nuts which would otherwise come in contact with the wood. All bolts shall be effectively checked for tightness after the nuts have been finally tightened.

Tie rods shall be carefully adjusted so that good alignment of the finished structure is obtained.

Where shown on the contract plans, the sheet pile walls shall be braced and aligned by means of timber wales. Wales shall be lapped and jointed at splices and corners, and solidly bolted or fastened together.

A geotextile fabric shall be placed on the back of the timber sheet piling as shown on the contract plans. The geotextile shall be protected from exposure to sunlight during transport and storage. After placement, the geotextile shall not be left uncovered for more than two (2) weeks.

Construction equipment will not be permitted directly on the geotextile. The geotextile may be joined by either sewing or overlapping. Sewn seams shall be lapped a minimum of 100 mm and double sewn. The thread used to sew the seam shall be nylon or polypropylene. Overlapped seams shall have a minimum overlap of 500 mm except where placed under water where the overlap shall be a minimum of 1 m. All seams shall be subject to the approval of the engineer. Geotextile which becomes torn or damaged shall be replaced or patched. The patch shall extend 1 m beyond the perimeter of the tear or damage.

METHOD OF MEASUREMENT:

This work will be measured as the number of meters of bulkhead satisfactorily installed in place. The measurement will be taken along the top centerline of the bulkhead sheeting.

BASIS OF PAYMENT:

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The unit price bid per meter of bulkhead shall include the cost of furnishing all labor, materials, equipment including pile driving machinery and all else necessary and incidental to complete the work described in this specification, in the contract plans or directed by the engineer. The work shall include the following: installing new bulkhead including timber piles, timber sheet piling, deadman piles, timber wales, geotextile fabric backing, pre-molded resilient joint material and complete tie-back systems as shown on the contract plans.