

ITEM 594.9506--10 M – RECYCLED PLASTIC LUMBER BULKHEAD

DESCRIPTION

This work shall consist of furnishing and installing recycled plastic lumber bulkhead as shown on the plans, as directed by the Engineer, and as herein specified.

MATERIALS

A. RECYCLED PLASTIC LUMBER SHEETING, CAPS, AND WALES

All sheeting bulkhead caps, and wales shall be recycled plastic lumber of type and strength specified herein.

All recycled plastic lumber shall be of reinforced foam polyolefin resins, shall conform to all color requirements specified in the plans, and shall have properties conforming to the following table:

| | <u>Minimum Average Value</u> | <u>Standard Deviation</u> |
|--|------------------------------|---------------------------|
| Modulus of Rupture (maximum fiber stress) | 20.41 MPa | 1.00 MPa |
| Shear Stress Parallel to Grain | 5.10 MPa | 0.21 MPa |
| Compression Perpendicular to Grain | 4.76 MPa | 0.41 MPa |
| Compression Parallel to Grain | 12.00 MPa | 0.69 MPa |
| Tension Parallel to Grain | 8.62 MPa | 0.76 MPa |

or equal as approved by the Engineer. All testing shall be in accordance with ASTM D-198.

B. HARDWARE

All hardware, which shall include but not be limited to bolts, nuts, washers, nails, spikes, tie rods, and turnbuckles, shall conform to ASTM Designation A307, Grade "A", and shall be hot-dipped galvanized steel in the manufacturing process. Galvanizing bath shall be free of ferrous impurities. Galvanizing shall be in accordance with Subsection 719-01 Type II.

C. FILTER CLOTH

Filter fabric shall conform to the requirements of Silt Fence under Section 207 – Geotextiles.

CONSTRUCTION DETAILS:

The Contractor shall be responsible for accurately locating all drainage and utility lines in the area and for taking all precautions necessary for their protection. Any damage to any drainage or utility lines by the Contractor, shall be repaired at his own expense.

Any bored holes, counter bores, or cuts in existing wood bulkhead to remain shall be coated with a water-borne wood preservative which shall conform to the requirements of Section 708-31.

ITEM 594.9506--10 M – RECYCLED PLASTIC LUMBER BULKHEAD

All necessary precautions shall be taken by the Contractor to assure that no debris falls into the water. All such debris shall be immediately retrieved. All timber and debris resulting from the removal of the existing bulkhead shall be legally disposed of, off site, at the Contractor's expense.

When construction is not in progress, the Contractor shall provide for the safety and welfare of the general public by adequately fencing areas open to any waterway, precipitous drop, and any other potentially hazardous area as directed by the Engineer. Temporary fencing shall be securely anchored and shall consist of wire mesh fabric or wood lath or a material of sufficient weight and rigidity to adequately span a maximum supporting post separation of 2.4 m. Prior to commencing work, the Contractor shall submit to the Engineer, for approval, detailed plans showing types of materials and methods of fabrication for the protective fencing. The Contractor, at all times, when construction is not in progress, shall be responsible for maintaining the fencing in good repair and upon notification by the Engineer shall take immediate action to rectify any deficiency. Upon completion of the work, the protective fencing shall become the property of the Contractor. Compensation for the furnishing, installation, maintenance, and removal of protective fencing for construction of the bulkhead shall be included in the price bid for this item.

All framing shall be true and exact. Spikes and nails shall be driven with sufficient force to set the heads flush with the surface of the lumber. All lumber shall be accurately positioned and securely held in opposition during the setting operation.

Sheeting shall be installed plumb and no undue jacking or pulling into position will be permitted. Out of position sheets will be rejected and shall be pulled and replaced with proper sheets by the Contractor at no additional cost to the State. If additional framing or wales are deemed necessary by the Contractor in order to attain proper alignment, the installation thereof shall be at the Contractor's expense.

Water jetting of bulkhead sheeting will be permitted except the last 150 mm of sheeting shall be set by mechanical pounding methods in a manner recommended by the manufacturer or otherwise suitable for driving the sheeting without damage to sheeting below the part that will be cut off.

All construction shall be tight and true. All lumber shall be new and unused, be free of damage and defects, and shall not be less in actual length nor thickness than that shown on the plans. Any damaged ends of sheeting, bulkhead caps, or wales shall be cut off to undamaged material.

All joints in bulkhead sheeting and connections between the sheeting and any existing or proposed drainage pipes or culverts shall be constructed tightly to avoid water penetration.

Filter cloth shall be stapled to the bulkhead sheeting as often as is necessary to avoid undue sagging or stretching of the fabric, or as recommended by the filter cloth manufacturer.

The deadmen and all tie rods shall be in place before any fill is placed against the bulkhead. All lifts of fill shall begin at the deadman and proceed towards the bulkhead. Fill adjacent to the bulkhead shall be select granular fill and shall be placed according to the plans. The Contractor shall maintain the integrity of all sections of existing bulkhead that will remain.

All galvanizing which becomes marred shall be repaired in accordance with Section 719-01.

The Contractor shall pay all fees and obtain all necessary permits. The Contractor shall conform with all Federal, State, County, and Village laws, ordinances, codes, and rules applicable to the work.

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METHOD OF MEASUREMENT

The quantity to be paid for under this item shall be the number of linear meters of new bulkhead furnished and installed as shown on the plans or as ordered by the Engineer, and shall be measured along the exposed face of the new bulkhead sheeting.

BASIS OF PAYMENT

The unit price bid for each linear meter of new bulkhead furnished and installed shall include protective fencing, protection of utilities, and the cost of furnishing all labor, materials, equipment, and all necessary hardware required to satisfactorily complete the work in accordance with the plans and specifications or as directed by the Engineer.

Construction of the concrete deadmen shall be paid for under the appropriate concrete item. All excavation required for the installation of filter fabric, tie rods, and deadmen as shown on the plans shall be paid for under the item for Trench and Culvert Excavation. Removal of any part of the existing bulkhead (timber and metal), removal of all debris created by work under this item, off site disposal of unsuitable excavated materials, including all existing timber, metal and tie rods shall be included in this item. The construction of a tight connection between the plastic lumber bulkhead and any existing or proposed drainage pipes or culverts penetrating the bulkhead shall be included in this item.