

500 STRUCTURES

ITEM 521 - BRIDGE TIMBER

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521.01 Description. Timber shall consist of furnishing, cutting, creosoting if specified, fitting, placing, and erecting of timber, and the furnishing and installing of all necessary hardware, as specified.

521.02 Materials. Materials shall conform to the following:

Timber piles, creosoted, if specified.....	711.26
Structural timber.....	711.26
Preservative treatment for structural timber.....	712.06

Hardware shall be of good quality and standard make. The Contractor shall be responsible for correct dimensions.

Bolts, washers, lag screws, nails, spikes, twisted drive dowels, anchor plates (for floor) and similar items shall be considered hardware.

Cast iron ogee or malleable ribbed washers shall be used under the heads of lag screws and at both ends of bolts bearing on timber.

All hardware except nails, spikes, twisted drive dowels, cast iron and malleable washers shall be galvanized steel conforming to Section 711.02.

521.03 General. Holes for bolts shall be drilled to the exact size of bolt. Holes for dowels and drift bolts shall be drilled 1/16 inch (1.6 mm) smaller than diameter of dowel or drift bolt. Holes for lag screws shall be neat size in the held timber and the size of screw at root of threads for the holding timber.

In case timber stringers are used, deck shall be fastened to each bent by at least three bolts 3/4 inch (19 mm) in diameter, provided with flat washers, through the cap and floor.

When creosoted timber is used, framing shall be done before creosoting. Cutting and boring of creosoted timber in the field shall be held to the minimum. Where field cutting is necessary, all cuts as well as other abrasions shall be given three (3) separate applications of hot creosote oil, Section 712.06 (120° to 160° F) (49° to 71° C) before assembling. Field holes drilled in or through creosoted timbers shall be pressure treated with creosote oil, Section 712.06 by a device capable of exerting at least 30 pounds per square inch (210 kPa) pressure. Bolts, drift bolts, and dowels shall be dipped in creosote before being placed.

Dimensions of timbers may be the American Standard Dressed size instead of nominal size.

521.04 Bents. Pile construction shall conform to Item 507. Templates shall be used to locate and hold piles in the proper position during driving. Piles supporting vertical loads shall be driven to the bearing required and all other piles to a firm bearing. The piling shall be cut off so that when in its final position the plane of the top will be parallel to the cap. Timber for framed bents shall be rigidly fastened together. Posts shall be doweled to sills or footings, using 1 inch (25 mm) by 24 inch (610 mm) dowels; caps shall be fastened to all posts or piles by 1 inch (25 mm) by 24 inch (619 mm) drift bolts. Cross-bracing shall be bolted to all posts or piles and caps or sill using 3/4 inch (19 mm) bolts with ogee washers.

521.05 Pile Caps. Pile caps in excess of 26 feet (8 m) in length may be spliced. The splice or joint shall be between piles and each piece shall bear on at least three piles. Joints shall be butt joints. An additional cap of the same size and material shall be placed under the spliced cap, between the two piles adjacent to the splice. This additional cap shall extend approximately 18 inches (0.5 m) beyond the center line of the supporting piles, and have beveled ends. The spliced cap shall be bolted to the supporting cap with four, 3/4 inch (19 mm) bolts, two bolts on each side of the splice. Bolts shall be provided with ogee washers at bottom support cap and countersunk at top of spliced cap. Bolt holes shall be drilled neat size. All spliced caps and supporting caps when creosoted, shall be cut, drilled and matched before treatment, and marked or labeled to insure proper reassembling. When splices are used the short caps supporting the splice, including the necessary hardware, shall be furnished with no additional expense to the City.

521.06 Wood Joists. Wood joists shall be sized to a uniform depth at ends so as to bring their top surface to the correct elevation. The outside lines may be butted over the bents, or floor beams, but all intermediate joists shall lap by each other so as to have full bearing on the bent or floor beam and shall be bolted together at these points.

At the center of each panel, the joists shall be bridged with 2 inch (50 mm) by 4 inch (102 mm) timber rigidly nailed in place or by other approved means such as metal bridging (tension members).

521.07 Plank Floor. Plank width shall be not less than 8 inches (203 mm). Plank shall be laid close together and spiked to alternate supporting joists if wood joists are used, or securely fastened as shown on the plans if steel joists are used. The plank shall bear firmly on all joists and shall be full width of roadway.

521.08 Strip Floor. The timber shall be of all of the same species in any one structure, surfaced at least one side and one edge. Strips shall have a thickness not to exceed 3 inches (76 mm). There shall be no variation of more than 1/8 inch (3.2 m) from the specified dimensions in material having the same amount of surfacing, and no variation in depth of more than 1/8 inch (3.2 m) between adjacent strips. All strips on a structure shall have the same surfacing. If a strip does not extend entirely across the roadway the splices shall be made over a joist and splices at the same joist shall not occur more often than in every third strip. The minimum length of floor strips, except in beveled triangles on skews, shall be 6 feet (1.8 m).

Each strip of floor shall be placed against the preceding strip laid, the greater dimension being vertical, and shall be spiked to the preceding strip at each end and at approximately 12 inch (0.3 m) intervals using cut spikes or drive dowels of 1/4 inch (6.4 mm) nominal size that will reach through the adjacent strip. If timber joists or beams are used every other strip shall be toe nailed to every other joist or beam using 20d nails. If steel joists or beams are used the strips shall be securely fastened to the joists by the use of approved metal clips.

Care shall be taken to have each strip vertical and tight against the preceding one and bearing evenly on all the joists and any special tools or equipment necessary to secure this result shall be used. The strips shall be laid in straight parallel lines. If the last strip placed does not fit snugly against the adjacent strips, careful measurements of the opening shall be made and strips of length to properly stagger joints shall be rip-sawed to make a tight fit. In no case will spreading of adjacent strips to take up this final gap distance be permitted.

521.09 Method of Measurement. Bridge timber shall be measured by the thousand feet board measure (MFBM) (cubic meter), obtained by using nominal sizes and actual lengths. Plank floors and strip floors, including the end planks for strip floors, shall be measured in square feet (square meter).

521.10 Basis of Payment. Payment will be made at the contract price for:

Item	Unit	Description
521	MFBM (Cubic Meter)	Bridge Timbers
521	Square Feet (Square Meter)	Strip Floor

521 Square Feet (Square Meter) Plank Floor