

dance with the plans and these specifications.

All non-prestressed reinforcing steel in concrete members will be paid for under the provisions of Section **703**.

Payment for each item includes all direct and indirect costs and expenses required to complete the work.

Payment will be made under:

Item No.	Pay Item	Pay Unit
7051000	Concrete Bridge Barrier Parapet	Linear Foot
7051005	Precast Concrete Barrier Parapet	Linear Foot
7051010	Concrete Bridge Barrier Parapet (Lightweight)	Linear Foot
7051100	Concrete Bridge Median Barrier	Linear Foot
7053000	Steel Bridge Railing	Linear Foot
70540XX	Concrete Bridge Railing Wall (<i>type or height</i>)	Linear Foot
7055010	Steel Handrail	Linear Foot
7055100	Metal Bicycle Handrail	Linear Foot

SECTION 706

WOOD PRODUCTS FOR USE IN HIGHWAY CONSTRUCTION

706.01 Description. This specification governs treated and untreated wood products for use in highway construction and pertains only to such products that become part of the completed work. Wood products for erection purposes such as falsework, forms, bracing, sheeting etc. shall be furnished by the Contractor without specification and direct compensation.

MATERIALS

706.02 Structural Lumber. Structural lumber shall be as described in current Southern Pine Inspection Bureau Special Products Rules. The Grade shall be Dense Structural 65 or better for use in wood bridge caps, stringers, flooring and beach groins. Where specified, treatment shall be in accordance with Section **707**.

706.03 Dimension Lumber. Dimension Lumber shall be as described in current Southern Pine Inspection Bureau Grading Rules, Section 300. The Grade shall be No. 1 Dense or better for use in wood bridge components other than as described in Subsection **706.02**. For other miscellaneous uses of lumber, the grades and sizes shall be in accordance with Southern Pine Inspection Grading Rules for the intended use. Where specified, treatment shall be in accordance with Section **707**.

706.04 Guardrail Posts. Wood posts and offset blocks shall be Southern Yellow Pine conforming to the requirements for rough or dressed timbers as described in the current Southern Pine Inspection Bureau Grading Rules, Section 400. The grade for guardrail posts and offset blocks shall be No. 1 or better. Posts shall be sawn square with all faces perpendicular to each other. Width or thickness exceeding the dimensions specified on plans will not be allowed. Lengths shall be as shown on the plans with a tolerance of plus 2 inches. All ends shall be sawn square.

706.05 Wood Fence Posts and Braces. Wooden fence posts and braces shall be round or sawn square as specified from Southern Yellow Pine. Sawn posts and braces shall be at least No. 2 grade for dimension lumber or timbers as applicable and as described in current Southern Pine Inspection Bureau grading rules. Round posts and braces shall be sound, free from decay, excessive knots, clusters of knots, or splits that exceed 1 1/2 times the diameter of piece. Seasoning checks not affecting serviceability will be permitted. All posts and braces shall be reasonably straight.

Line posts and post braces, unless otherwise specified, shall be round posts having a nominal diameter of 4 inches with no diameter less than 3 1/2 inches at any point or square posts sawn nominal 4 by 4 inches with no dimension less than 3 5/8 inches (rough) and 3 1/2 inches (dressed).

End, corner, gate and pull posts shall be round posts having a nominal diameter of 6 inches with no diameter less than 5 1/2 inches at any point, or square posts sawn nominal 6 by 6 inches with no dimension less than 5 5/8 inches (rough) or 5 1/2 inches (dressed).

Lengths of posts shall be so furnished as to provide a uniform height of 5 inches above the top strand of wire and a minimum embedment in firm ground of 2 1/2 feet for line posts and 3 feet for other posts.

Unless otherwise specified, treatment method of Southern Yellow Pine posts and braces shall be in accordance with Section **707**.

706.06 Timber Piles. Timber piles either treated or untreated shall meet general quality requirements and physical characteristics as herein specified. Where specified, treatment will be in accordance with Section **707**.

A. Timber Piles. Piles shall be cut from sound, live trees, except that fire killed, blight killed or wind felled timber may be used if not attacked by decay or insects. Piles shall be cut above the ground swell and with both tip and butt ends sound.

B. Knots. Sound knots shall be no larger than one sixth the circumference of the pile located where the knot occurs. Cluster knots shall be considered as a single knot, and the entire cluster cannot be greater in size than permitted for a single knot. The sum of knot diameters in any one-foot length of pile shall not exceed one third of the circumference at the point where they occur. The size of a

knot shall be its diameter measured at right angles to the length of the pile.

Piles may have unsound knots not exceeding half the permitted size of a sound knot, provided that the unsoundness extends to not more than 1 1/2 inches depth and that the adjacent areas of the trunk are not affected.

C. Checks, Shakes, and Splits. A check shall not extend any deeper than to the pith. There shall not be any two or more checks extending to the pith that become contiguous at the pith, except as modified under splits. A check is defined as a lengthwise separation of the wood across the rings of normal growth, extending from the surface toward the pith, but not extending through the piece.

The length of any shake or combination of shakes in the outer one half of the radius of the butt of the pile, when measured along the curve of the annual ring, shall not exceed one third of the circumference of the butt of the pile. A shake is defined as a circumferential separation of the rings of normal growth.

Splits shall not be longer than the butt diameter. A split is defined as a lengthwise separation of the wood across the rings of normal growth, extending from one surface through the piece to the opposite surface.

D. Holes and Scars. Holes less than 1/2 inch average diameter shall be permitted in piles, provided the sum of the average diameters of all holes in any one square foot of pile surface does not exceed 1 1/2 inches, and the depth of any hole does not extend to more than 1 1/2 inches.

Piles having sound turpentine scars undamaged by insects shall be permitted.

E. Sapwood in Piles for Treatment. Piles for use with

preservative treatment shall contain a minimum of 1 1/2 inches of sapwood.

F. Peeling. Piles for treatment shall be peeled of bark, including the inner skin, soon after cutting so that piles are smooth and clean. Care shall be taken to remove as little sapwood as possible while peeling the bark.

The sapwood shall not be injured by unnecessary axe cuts. No pile shall be considered peeled unless all of the rough bark and at least 80% of the inner bark along the pile length, has been removed. In no case shall any piece of inner bark be over 1/2 inch in width or over 6 inches in length, and there shall be 6 inches of clean wood surface between any two strips of inner bark.

G. Taper and Surface Finish. Piles shall have a gradual taper from the point of butt measurement to the tip. Knots and limbs shall be cut flush with the surface of the pile in a manner to prevent fiber breaks around the knot. Knots may be hand-trimmed flush with the surface of the swell surrounding the knot. The butt and tip shall be sawed square with the axis of the pile to an accuracy of 1/10 inch per inch of diameter.

H. Twist of Grain. Spiral grain shall not exceed 180° of twist when measured over any 20 foot section of the pile.

All piles shall be straight to the extent that a line drawn from the center of the butt end of the center to the tip end shall lie within the middle 2/3 of the body of the pile at all points. Piles shall also be free from short crooks in which the surface deviation from straightness in any 5 feet of length exceeds 1 1/2 inches at any location as determined by a straight edge.

I. Dimensions. The diameters of piles measured under the bark shall conform to the requirements shown in the following **Table 1**, subject to a permissible variation of minus 1/2 inch in any diameter in not more than 20% of the

piles of that diameter.

Length (feet)	Diameter at 3 Feet from Butt (inches)		Minimum Diameter of Tip (inches)
	Minimum	Maximum	
Under 25	11	20	8
25 to 40 inclusive	12	20	8
40 to 50 inclusive	12	20	7
50 to 70 inclusive	13	20	7
70 to 90 inclusive	13	20	6
Over 90	13	20	5

The diameter of a pile in cases where the tree is not exactly round shall be determined either by measuring the circumference and dividing the number of inches by 3.14, or by taking the average of the maximum and minimum diameters at the location specified.

The specified length of piles shall be in multiples of 5 feet. For piles 40 feet and shorter, the length may exceed the specified length by one foot. For piles 45 feet and longer, the length may exceed the specified length by 2 feet.

CONSTRUCTION REQUIREMENTS

706.07 Storage of Materials. Treated and untreated wood products shall be shipped and stored by acceptable commercial methods that will prevent damage before use in the work.

706.08 Workmanship. Construction requirements shall be as set forth in other sections of these specifications that govern the items of work using the specified wood products.

706.09 Measurement and Payment. Measurement and payment for wood products will not be specifically made under this section of the specifications. Measurement and payment will be made in accordance with other sections of these specifications that govern the items of work including wood products.

SECTION 707

PRESERVATIVE TREATMENT OF WOOD PRODUCTS

707.01 Description. This specification governs preservative treatment for timber and lumber for guard rail posts, fence posts, fenders and dolphins, and piling in accordance with the following specifications. Unless otherwise specifically authorized by the Department, inspection of the material to be treated and of the treatment process will be made by the Department or by its authorized inspection agency. The material to be treated will normally be inspected before treatment and the inspection of the treatment process will be made while the process is actually taking place.

The treatment plant shall provide laboratory facilities on the premises for the Department or its authorized inspection agency. The laboratory shall include technicians, conforming to AWPA M-3, Paragraph 1.5 for determining the retention by assay method and making analysis of the treating solution. Smaller plants treating only fence posts or miscellaneous lumber will not be required to have on premise laboratory facilities for testing waterborne preservatives, but will be required to bear the expense of such testing. The Department or its inspection agency will perform the testing in these instances.