

2.24.1 General:

CONTRACTOR shall furnish and install bridge timbers as indicated on project plans. All labor, material and equipment to unload, haul, and properly install bridge timbers shall be furnished by CONTRACTOR.

CONTRACTOR shall supply and install all hardware, spikes, and OTM onto the bridge as designated on the Plans. If not designated otherwise in the Plans, CONTRACTOR will be responsible for relaying the existing rail on the bridge with new track spikes supplied by CONTRACTOR and reusing the existing OTM.

2.24.2 Materials:

2.24.2.a Bridge Timbers:

2.24.2.a.1 Species:

Unless noted otherwise on the Plans, all structural lumber for caps, stringers, structural deck ties and sills shall be either Douglas Fir Select Structural for beams and stringers or Southern Pine Dense Select Structural for 5"x5" or larger.

Unless noted otherwise on the Plans, all structural lumber for tie, spacer timbers, bracing, posts, and misc. timbers shall be either Douglas Fir No. 1 for posts and timbers, or Southern Pine No. 1 Dense for 5"x5" or larger.

For equivalent species the following wet service condition (moderate decay hazard) strengths shall be meet the following:

	F _b (psi)	F _c (psi)	F _v (psi)	F _c □ (psi)	E (ksi)
Select Structural (Caps, stringers, sills, some ties)	1440	900	150	380	1600
No. 1 (Ties, braces, posts, spacer timbers)	1050	725	150	330	1500

2.24.2.a.2 Physical Requirements:

All structural grade lumber shall conform with requirements as outlined in the current AREMA Manual for Railway Engineering, Chapter 7, Part 1, Sections 1.1 through 1.9.5 and 1.14, with the following provisions;

All lumber shall be cut from live sound timber free from any defects that may impair its strength and durability as structural bridge lumber. All structural lumber shall be straight, square sawn, cut square at ends, and totally free of bark. Incising is desirable. The following specifications will determine the acceptability of structural lumber:

1. Straightness- no deviation greater than 1/8" from any surface plane given is permissible, which includes bow, cup, and twist.
2. Square Sawn- all surfaces of lumber shall be parallel and be within 1/8" of the dimension specified. Score marks from sawing shall not exceed 1/8" in depth.
3. End Square- end cuts shall be square (90 degrees) relative to the top, bottom and sides.
4. Decay- no decay will be allowed.
5. Grain- lumber shall possess relatively straight grain. Slant in grain that exceeds one in twelve will be rejected.
6. Knots- in accordance to applicable grading standards; WCLIB for Douglas Fir, and SPIB for Southern Yellow Pine.
7. Splits- splits over 1/4" in width and a half the member width in length without applied anti-splitting device will not be allowed. In no case shall splits cross the full width of the member regardless of application of anti-splitting device.
8. Season Checks- checking over a quarter of member depth in the end face without an anti-splitting device shall be rejected. Checking over a quarter of member depth in any face long than 30 percent of member length shall be rejected.



9. Shake- length of interconnected shake shall not exceed 30 percent of the end width of the member or be located within 1” of any surface face.
10. Wane- Accumulative wane on any surface face exceeding 1” will be rejected.

2.24.2.a.3 Treatment:

All structural lumber shall be seasoned prior to treatment as outlined in the AREMA Manual, Chapter 30, Section 3.6.

All structural lumber shall be pressure-treated creosote as outlined in the AREMA Manual, Chapter 30, Section 3.6 and Section 3.7, minimum of 8 pounds of retention of treatment per cubic foot of wood, or pressure-treated copper naphthenate as outlined in American Wood Producers Association Standard (AWPA) C2, C3, and C14, minimum of .075 pounds retention of treatment per cubic foot of wood.

Upon completion of treating, excess treating material shall be removed from the exterior surface of lumber by vacuum or other process and shall provide a dry surface.

2.24.2.a.4 Shipment:

All structural lumber shall be handled with equipment that prevents damage to the treated surface. Surface gouging, deep scratches, grapple impressions, timber tong punctures, etc., that damage or penetrate the surface of the lumber sufficiently to expose untreated layers or allow water pocketing to occur will be rejected. Lumber shall be adequately supported to prevent twisting and warping and shall not be damaged from restraining fixtures during transport.

2.24.2.a.5 Dimensions:

Timber bridge ties and headwall timbers shall be dimensioned in the quantities as shown in the Plans. Treated bridge ties and headwall timbers may have the following variances:

Length: plus 1", minus 1/2"

Thickness: $\pm 1/8$ "

Width: $\pm 1/8$ "