

STANDARD FOR GLUED LAMINATED TIMBER BRIDGES

1. SCOPE

Provide a standard for production of glued laminated wood used in the bridge installation. This standard is intended to cover several types of glulam bridges. This standard is intended to augment, or support, design requirements that may be issued by the owner.

2. DEFINITIONS AND ABBREVIATIONS

STRUCTURAL GLUED LAMINATED TIMBER (WOOD) : An engineered stress-rated product of a timber laminating plant, comprised of wood laminations bonded together with adhesives. The grains of all laminations are approximately parallel longitudinally. See AITC 117 for a more detailed explanation.

GLULAM: Structural glued laminated timber (wood)

AITC: American Institute of Timber Construction, located at 7012 S. Revere Parkway, Suite 140, Englewood, Col. 80112

APA/EWS: Trademark appears on products manufactured by American Wood Systems members. American Wood Systems is a related Corp. of the American Plywood Association 7011 South 19th St. PO Box 11700, Tacoma Wa 98411

AWPA: American Wood Preservers Association, located at 7735 Old Georgetown Road, Bethesda, Maryland 20014

3. QUALIFICATIONS OF FABRICATOR

3.1 The panelized bridge manufacturer shall be one regularly engaged in the business of manufacturing glued laminated wood and /or bridge members, and a qualified licensee of the AITC or APA/EWS.

3.2 All Glued laminated Timber shall be factory fabricated (as far as practical) by a licensed AITC or APA/EWS laminator. This shall include cutting drilling and other fabrication as shown on shop drawings.

4. CODES AND STANDARDS

In addition to complying with all pertinent codes and regulations, material and installation procedures shall comply with the following:

4.1 American Association of State Highway and Transportation Officials (AASHTO)

- 4.2 American National Standard for Wood Products-Structural Glued Laminated Timber ANSI A190.1- LATEST EDITION
- 4.3 Adhesive: all members bonded with exterior "wet-use" conforming to ASTM D 2559
- 4.4 Proof-loading system for laminated finger joints to be in accordance with ANSI A190.1

5. CERTIFICATIONS

5.1 Certifications required by the laminator:

5.1.1 The AITC or APA/EWS Certificate of Conformance with AITC/ANSI A190.1-1992

5.1.2 A copy of the approved shop drawings, sealed by the laminator, certifying that the materials shown on the drawings conform to these specifications.

5.2 Preservative treatment certification required (if applicable)

5.2.1 Certificate of treatment shall be furnished by a certified AWPA treating facility. The treating certification shall list the identification of job, species of materials, type and retention preservative provided, as well as the AWPA standard used as the guide for treating. In the event treated timber originates from more than one treating facility then certification shall be furnished from each facility providing timber for this project.

6. STRUCTURAL DESIGN

The bridge shall be designed in accordance with good engineering practices and in accordance with the standard specifications as adopted by the American Association of State Highway and Transportation Officials (AASHTO). The Bridge design shall be a glued panelized system. The use of nails or lags will not be accepted.

6.1 The structure shall be designed for the following loads and dimensions:

- 6.2.1** Dead Load (
 - 6.2.1.1** Bituminous overlay/wearing surface (in.) _____
- 6.2.2** Live Load HS _____
- 6.2.3** Wet-Stress design values shall apply _____
- 6.2.4** Live Load deflection (L/) _____
- 6.2.5** Overall length of span (ft) _____

6.2.6 Overall Roadway width (ft) _____

6.2.7 Skew (degrees) _____

7. **TIMBER MATERIALS**

- 7.1 Lumber-intended for structural use with design stress shall be graded in conformance with accepted standards for allowable unit stresses (See AASHTO Section 13)
- 7.2 Finish Grade-Industrial Appearance Grade as per AITC 110
- 7.3 All lumber to be Coastal Douglas Fir or Southern Yellow Pine.

8. **PRESERVATIVE TREATMENT**

All timber to be treated with the following preservatives

- 8.1 Pentachlorophenol in Type A oil conforming to AWWA Standard C-28, C-14, P-9 & U1-07 Retention level shall be 0.6 PCF as per AWWA Standard C-28.
- 8.2 Incising shall be required for all Douglas Fir materials.
- 8.3 All treatment specifications are to be in accordance with AWWA 2006 U1 Use Codes
- 8.4 Timber pedestrian deck, curb and railings may be treated with the water borne preservative, CCA, to a net retention of 0.4 PCF. This treatment shall be performed prior to gluing.

9. **HARDWARE**

- 9.1 Fabricator shall provide all connection steel and hardware for joining wood members to each other and to their supports exclusive of anchoring embedded in concrete.
- 9.2 All fasteners shall be galvanized (ASTM A-123) mild steel ASTM A307. Washers to be cast iron or malleable iron, timber type.
- 9.3 All steel plates and shapes to be galvanized (ASTM A-153) mild steel ASTM A-36
- 9.4 Aluminum deck brackets to be cast aluminum alloy 356
- 9.5 "C" Clips shall be galvanized (ASTM A-153) Cast iron – Grade 30

10 **BEARING PADS**

- 10.1** Fabricator shall provide neoprene bearing pads in areas where glulam girder or longitudinal decking material rests on steel or concrete abutments. Width shall be sufficient to support bearing.
- 10.2** The durometer hardness shall be between 50 and 70, and shall have a minimum strength of 800 PSI.

11 MATERIAL: DELIVERY, STORAGE AND HANDLING

- 11.1** Special care shall be taken for all materials required for the project. Shipping, storage and erection practices shall be in accordance with industry standards.
- 11.2** Wrapping of treated glulam bridge members shall not be required.

Note: the latest revisions and editions for all standards mentioned in the above specifications shall be used.