

American Railway Engineering and Maintenance of Way Association

Letter Ballot 07-22-01

1. Committee and Subcommittee: Committee 7, Timber Structures; Subcommittee 2, Material Specification and Design, Rating and Loading Requirements for Timber Structures.

2. Letter Ballot Number: 07-22-01

3. Assignment: C2-1-16: Review and update Parts 1-3 and associated commentary of Chapter 7.

4. Ballot Item: Add wording in Article 2.5.9 Horizontal Shear with associated commentary (see attached):

5. Rationale: Clarify the handling of design for shear in stringer chords with mixed continuous and non-continuous stringers.

6. Vote: Approve _____ Disapprove _____ Abstain _____

*Note: If you have a conflict of interest on the topic being considered, you must mark the ballot "Abstain."

7. Comments: Comments must be provided when voting to disapprove or abstain. Use additional space on back or attach sheet as necessary.

8. Voting Deadline: Please vote ONLINE. If you are unable to vote online, please e-mail your ballot to Stephanie Swanson at stephanie.swanson@bnsf.com. The deadline to vote is **May 27, 2022**.

9. Signature: I have read the regulations Governing AREMA Technical Committees and have complied with all its requirements.

Signed: _____ Name (Please Print): _____

Date: _____ E-mail (if changed): _____

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Proposed changes as follows:

Deleted text noted by ~~striketrough~~.

Added text shown by underline.

Modify Article 2.5.9 Horizontal Shear, Paragraph c. (4), as follows:

- c. (4) When a beam spans continuously over one or more supports, continuity shall be considered when calculating V. Where stringer chords are a mix of continuous and non-continuous stringers at an intermediate support, the shear load imposed on the continuous stringers may be larger than the amount on the non-continuous stringers due to the higher stiffness of the continuous stringers.¹

¹ See Part 6 Commentary

Add new commentary Article 6.2.5.9 Horizontal Shear, Paragraph c. (4):

6.2.5.9 Horizontal Shear

- c. (4) In the design of plies in stringer chords, the applied shear load is shared between each ply in proportion to its relative stiffness in relation to the other plies in the chord. The horizontal shear calculation for each ply is affected by whether the chord ply is continuous or non-continuous at a reaction point. Typically, the stiffness of the continuous member is greater than the stiffness of the non-continuous member, assuming the ply material and size are the same. This means that in most cases the continuous plies will carry more shear load than the non-continuous plies. To establish the correct applied load for horizontal shear calculations for each chord ply, the relation between the stiffness should be used.

Care should be exercised in these calculations since if the assumption is made that all plies carry the load equally, both continuous and non-continuous or an average of the two, the continuous ply will be over-stressed, and the longevity of the overall chord will be reduced. If this approach is taken in the design of the chord shear properties, the continuous plies fatigue faster than the non-continuous plies and horizontal shear failures could be expected to occur in the continuous plies.