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"TPI Consensus Standard Update" by Charles B. Goehring, Managing Director, TPI

The successful marketing of metal-plate-connected wood trusses starts with model building code acceptance. Historically, TPI design criteria was formulated in 1959 and published the following year with the designation TPI-60 “Design Specification for Light Metal Plate Connected Timber Trusses.” Nine subsequent editions, culminating with ANSI/TPI 1-1995 “National Design Standard for Metal Plate Connected Wood Truss Construction,” reflect truss usage under varied conditions, thousands of full scale truss tests, research at leading universities and testing locations, and more than 40 years of state-of-the-art practical engineering experience. ANSI/TPI 1-1995 has been adopted by reference in the latest edition of BOCA’s “National Building Code—1996,” ICBO’s “Uniform Building Code—1997,” SBCCI’s “Standard Building Code—1997,” and the final draft of ICC’s “International Building Code—2000,” thus assuring nationwide acceptance of engineered MPC wood trusses.

ANSI/TPI 1-1995 is the truss industry’s first American National Standard developed in strict accordance with ANSI’s organizational method to achieve consensus. A consensus standard is the result of considerable input from various interests (e.g., all sectors from the truss industry, research institutions, model code agencies and the public whom are directly and materially affected by the standard. As a condition of TPI’s accreditation with ANSI, American National Standards (ANS) must be reaffirmed, revised or withdrawn on a 5-year cycle. ANSI/TPI 1 was conferred ANS status February 13, 1995. Consequently, TPI’s revision/reaffirmation cycle for [proposed] ANSI/TPI 1-2000 was initiated with the 1st letter ballot going to a balanced project committee comprised of 45 registered voting members (Producer—12, User—18, General Interest—15) on May 19, 1998. Appropriately, professional engineering credentials are a requirement of ANSI/TPI 1’s Project Committee “User” interest category and TPI’s Technical Advisory Committee; which directly supports TPI’s mission of maintaining the wood truss industry on a sound engineering basis. Partly due to this emphasis, ANSI/TPI 1 project committee member (45) credentials are very impressive with nearly 95% of its membership holding professional engineering registration, and numerous members having advanced degrees in engineering and wood science.

As a result of the 1st letter ballot to revise/reaffirm and 2nd letter ballot to resolve substantive modifications, the following criteria to [proposed ANSI/TPI 1-2000] have achieved evidence of consensus within the project committee:

- A simplified structural analysis method, commonly referred to as the “Empirical Analysis” developed in the late 1970’s to produce more precise effective buckling and moment length factors for statically determinate trusses, should be relegated to a nonmandatory appendix.
- A new design procedure addressing steel net-section and lateral resistance for splice joints

subjected to combined tension and bending forces. Applied research was provided by Virginia Tech's Philip O'Regan & Frank Woeste with support from Alpine Engineered Products.

- A more comprehensive design procedure was developed to address bottom chords of girder trusses subjected to tension perpendicular to grain forces resulting from face mounted hangers with nails. Applied research was provided by Alpine Engineered Products.
- The adoption of the 2% rule for cumulative truss member buckling forces to assist the building designer in the specifying of permanent lateral braces and attending stabilization bracing (e. g. bays of diagonal/cross bracing or equivalent).
- A 15% increase to F_b and a 10% increase to F_c and F_t for solid sawn graded lumber truss members to which structural wood sheathing is mechanically attached. A 10% increase to F_b, F_c and F_t to which structural wood sheathing is not attached, shall only apply to chord members where three or more trusses are positioned side by side, are in contact, or are specified no more than 24" o.c. and are joined by roof sheathing, flooring, gypsum or other load distributing elements attached directly to the chords. About 8 years ago truss systems testing was conducted under the direction of Ron Wolfe, P.E. of the U.S. Forest Products Laboratory with primary funding support from TPI. Truss
- systems modeling, calibrated from this earlier truss systems testing, was performed under a contract with the University of Wisconsin—Madison with primary support from WTCA. Work on this project has been performed by Cade Christiansen and John Drozdek under the direct of Professor Steve Cramer, P.E.

Evidence of consensus for these items were achieved within the project committee when 2/3 the ballots cast (not including abstentions) were in the affirmative. Later this summer proposed [ANSI/TPI 1-2000 draft 1] will be submitted to ANSI for public review. Public comment from project committee members or individuals, must be resolved by the project committee before TPI can claim complete evidence of consensus to ANSI's Board of Standards Review. We are optimistic that the revision/reaffirmation process will be completed prior to the 5-year renewal target date.

Assuming that the aforementioned revisions achieve evidence of consensus unchanged, the repetitive member increase factors for F_c and F_t will have a significant and positive effect on truss construction, by possibly changing chord requirements by one stress grade.

WTCA 1-1995

At WTCA's request (10/21/98), TPI is developing evidence of consensus for [proposed ANSI/TPI/ WTCA 4-2000] "Standard Responsibilities in the Design Process Involving Metal Plate Connected Wood Trusses" known as WTCA 1-1995. Other than organizational changes and some minor modification to the definitions for "truss designer" and "building designer," the document should be ready for its first public comment by late summer. Design responsibility definitions

found in [proposed ANSI/TPI/WTCA 4-2000] have been harmonized with those found in [proposed ANSI/TPI 1-2000]. This is necessary should the project committee adopt by reference [proposed ANSI/TPI/WTCA 4-2000] into [proposed ANSI/TPI 1-2000]. Although [proposed ANSI/TPI/WTCA 4-2000] is probably not suitable for adoption by itself in ICC's "International Building Code," it should achieve some semblance of law through its adoption by reference in model code approved [proposed ANSI/TPI 1-2000]. This will help in the truss industry's effort to formulate truss policy with the state boards of professional regulation.

SBC HOME PAGE

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