

Frequently Asked Questions

Attic Loading by Ryan Dexter

Attic loading varies depending on how the space will be used, as it is defined by ANSI/TPI 1.

There seems to be some misconception regarding attic trusses and attic loading. We recently received the following question:

QUESTION:

What is the formal definition of an attic truss? My building department is insisting that ten pounds per square foot (PSF) must be added to the bottom chord live load of a common truss even if there is no room for attic storage.

ANSWER:

According to the third edition of the WTCA Metal Plate Connected Wood Truss Handbook, an attic frame is "a frame with a truss profile and a rectangular opening in the web area for a living space. The bottom chord is designed to take associated live loads." They are also called attic trusses and room-in-attic trusses. It is doubtful that this is what your building department means.

Many building codes, including the IBC, IRC and BOCA, require that bottom chord live loads be added to common trusses in anticipation of attic space being used for storage. The particular load requirements and space configurations vary by code but ANSI/TPI 1-1995 lists recommended minimum design loads in Appendix B (Pages 36-38) [Editor's Note: ANSI/TPI 1-2002 Appendix B pages 78-80].

TPI 1 explains the differences between habitable attics (like attic frames), uninhabitable attics, accessible attics and non-accessible ceilings.

ANSI/TPI 1-1995 & 2002 B.2.2 Bottom Chord Live Load

Habitable attics 30 PSF

Uninhabitable
attics 20 PSF

Accessible attics* 10 PSF

Non-Accessible
Ceilings 3 PSF

*B.2.7 Accessible attics are herein defined as those served by a scuttle or a pull down stair

Given this, the ten PSF load your building department is requesting may not be out of the question. You should ask the building department for the complete code provision they are referencing so you have a good understanding of the code provision they are enforcing.

The 2002 edition of ANSI/TPI 1 (approved March 25, 2002) has a provision that requires this extra bottom chord loading to be run as another load case with only dead loads, not as a design load.

ANSI/TPI 1-2002 6.2.1.1

Attic live loads, other than floor live loads, that are applied to the entire length of the bottom chord shall not be required to be applied concurrently with other live loads.

It is also important to determine if the local code references a specific edition of TPI 1. Many codes do not yet reference ANSI/TPI 1-2002. For example, IBC 2003 references the 2002 standard, but it could be several months or years before local building jurisdictions adopt it. However, it is always possible to be able to use the latest state-of-the-art code language available to resolve field issues with the most current thinking (see sidebar article below). TPI, WTCA and WTCA chapters will work with any local jurisdiction on understanding these issues and implementing an approach that works well for all involved.

Important Recent Development

The ICC Code development hearings for the 2004 Supplement of the International Codes began September 5, 2003. The joint proposal by WTCA, TPI and AF&PA regarding attic live loads was addressed by both the IBC Committee and the IRC Committee. The results of these two separate hearings are as follows: the proposal ("Proposal S14-03/04") was defeated by the IBC Committee, but a modified version of S14-03/04 was approved by the IRC Committee.

Despite the concerns and questions, there were several IBC Committee members who expressed that they liked the idea of the change and felt something like it should eventually get into the code, but that they were uncomfortable with the current form. Thus, although our attic live load proposal was defeated at this initial hearing, there is a sentiment for the need for this change within the IBC Committee. We will continue to work closely with TPI and AF&PA to eliminate the questions and challenge this outcome during the forthcoming public comment period. With due diligence we feel that the negatives can be overcome and the code change concepts will prevail.

On a much brighter note, prior to the IRC Committee hearing, a modified S14 Proposal (see Figure 1) was distributed to the IRC Committee. The original proposal (as submitted for the March 24, 2003 proposal submittal deadline) was modified in an effort to address at least some of the concerns expressed during the IBC Committee hearing. In particular, the proposal was modified to re-solve the following two concerns:

- In response to the comments that the proposal was too long or cumbersome and could be better organized, the proposal was shortened and simplified as much as possible, while still maintaining the code change that we were looking to accomplish as it relates to trusses.
- Rather than address the attic loading within the corresponding material-specific sections, which prompted the concern that it did not include steel, the modified proposal addresses the attic loading provisions simply as footnotes to the live load table, which can then apply to all framing and material types.

This modified proposal was approved by the IRC Building/Energy Committee, which will resolve the attic live loading issue within the IRC. Figure 1 shows the text of the code change approved by the IRC Building/Energy Committee.

WHAT THE CODE REVISIONS MEAN

The code revisions bring to the ICC codes the approaches and provisions of the prior codes, specifically BOCA and UBC, which addressed attic live loads in truss applications in a satisfactory manner. Once the concepts are formally adopted by the IRC in May 2004, we will implement these changes throughout our industry. This will allow us to continue doing business as we have in the past.

If there are local concerns regarding this issue, you will need to approach your building department with the draft or the final version of the IRC adopted language. Please consider involving your local WTCA chapter (and your plate company truss design engineer). A unified approach from the local truss industry/chapter will yield better results than acting independently. Working together, we will continue to build on our successes.

Proposed Modification for S14-03/04, items 5 – 7

Completely replace the entire IRC portion of the proposal (items 5 – 7) with the following single item:

Revise as follows:

TABLE R301.5 MINIMUM DISTRIBUTED LIVE LOADS

Attics with <u>limited storage</u> ^{b, g, h}	20
Attics without storage ^b	10

Revise footnote b and add footnotes g and h as follows:

- b. No attic storage with roof slope not over 3 units in 12 units. Attics without storage are those where the maximum clear height between joist and rafter is less than 42 inches, or if there are not 2 or more adjacent trusses with the same web configuration capable of containing a rectangle 42 inches high by 2 feet wide, or greater, located within the plane of the truss. For attics without storage, this live load need not be assumed to act concurrently with any other live load requirements.
- g. For attics with limited storage and constructed with trusses, this live load need only be applied to those portions of the bottom chord of not less than two adjacent trusses with the same web configuration containing a rectangle 42 inches (1067 mm) high or greater by 2 feet (610 mm) wide or greater, located within the plane of the truss. The rectangle shall fit between the top of the bottom chord and the bottom of any other truss member, provided that each of the following criteria is met:
- The attic area is accessible by a pull-down stairway or framed opening in accordance with Section 807.1; and
 - The truss shall have a bottom chord pitch less than 2:12.
- h. Attic spaces served by a fixed stair shall be designed to support the minimum live load specified for sleeping rooms.

Figure 1. Bracing Options for Gable End Frames

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