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WTCA Update

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Application of Non-concurrent Attic Loads & Presentation on Truss Drawings by WTCA Staff

Learn more about how diligent dialogue with building code departments resulted in another step toward the consistent application of the code across the country.

In May 2004, the International Building Code and the International Residential Code updated the IBC and the IRC to clarify the application of storage loads as follows:

Table 1607.1: MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS AND MINIMUM CONCENTRATED LIVE LOADS		
OCCUPANCY OR USE	UNIFORM (psf)_	CONCENTRATED (lbs.)
27. Residential Group R-3 as applicable in Section 101.2 Uninhabitable attics without storage [i] Uninhabitable attics with limited storage [i, j, k] ***(remainder unchanged)***	 10 20	

Notes: Add notes i, j, and k as follows: (notes a. through h. unchanged)

i. Attics without storage are those where the maximum clear height between joist and rafter is less than 42 inches, or where 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.

j. For attics with limited storage and constructed with trusses, this live load need only be applied to those portions of the bottom chord where there are two or more adjacent trusses with the same web configuration capable of 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 all of the following criteria are met:

i. i. The attic area is accessible by a pull-down stairway or framed opening in accordance with Section 1209.2; and
ii. ii. The truss shall have a bottom chord pitch less than 2:12.
iii. iii. Bottom Chords of trusses shall be designed for the greater of actual imposed dead loads or 10 psf (478Pa), uniformly distributed over the entire span.

k. Attic spaces served by a fixed stair shall be designed to support the minimum live load specified for habitable attics and sleeping areas.

TABLE R301.5 MINIMUM DISTRIBUTED LIVE LOADS	
Attics with limited storage[b, g, h]	20
Attics without storage[b]	10

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

b. Attics without storage are those where the maximum clear height between joist and rafter is less than 42 inches, or where 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 where there are two or more adjacent trusses with the same web configuration capable of 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:

i. i. The attic area is accessible by a pull-down stairway or framed opening in accordance with Section 807.1; and
ii. ii. 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.

There are several local jurisdictions that have looked at this code change with respect to how to apply it. In Michigan, the concept used in the current MRC regarding attics without storage is

identical to the revisions shown above for both the IBC and IRC. Here the truss is designed using a 10 psf non-concurrent live load. The concept of attics with storage (i.e., 20 psf live load) is also the same with one exception—how it applies and when it applies to the truss bottom chord is improved and more accurately reflects how storage loads will be applied in realstructures/ houses. With the new revisions to Table IBC 1607.1 and IRC 301.5 either the MBC 1607.1 and MRC 301.5 approach or the IBC 1607.1 and IRC 301.5 approach is technically correct when applying bottom chord live loads to trusses.

In accordance with the Michigan Department of Consumer & Industry Services' Bulletin, Volume 8, Issue 2, February 2003, article entitled Model Roof Truss Design Criteria, by Larry Lehman, (see Support Docs), metal plated wood roof trusses shall be designed for bottom chord live loads as follows:

- "The 2000 Michigan Building Code (MBC), Table 1607.1, and the 2000 Michigan Residential Code (MRC), Table R301.5, state that an attic without storage shall be designed for a live load of 10 psf and an attic with storage shall be designed for a live load of 20 psf."
- "Second, the committee agreed with Publication Number 44 that the 20 psf attic storage load shall be applied only in areas intended for storage as clearly identified on the design documents and the Roof Loading Data Sheet. This is consistent with the language of the 2000 International Residential Code for One-and Two-Family Dwellings commentary. Last, the committee agreed that the minimum 10-psf attic live load shall be non-concurrent. It was agreed that the intent of the 10-psf attic live load is for construction loading and is not required to be applied concurrently with other transient live loads. This follows the requirement of the ANSI TPI-1-2002."

Truss manufacturers will design their trusses with this 10 psf non-concurrent live load applied as one of the load conditions that are checked to see if it affects the design of any of the wood truss members or metal connector plates. Given the snow load conditions that prevail in Michigan, this load condition will rarely control in the truss design process. A note typically appears on the truss design drawings, as part of a series of other notes, stating that the truss was designed with a 10 psf non-concurrent bottom chord live load. This will be the designation that the truss design has accounted for the loading conditions as defined in IBC 1607.1 (MBC 1607.1) and IRC 301.5 (MRC 301.5).

Our goal in working with the building code departments at both the national and local level is to provide a consistent application of the code in all areas of the country. Through consistency we feel that we will enhance accuracy in applying the code to truss construction and better buildings will result.

SBC HOME PAGE

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