

What Is An Attic?

By John Gerber

Well, for me, the attic in my house is a space to store boxes of clothes and photo albums that Aunt Geneva put together in 1949. For flat roof facilities, here is “the rest of the story.”

Webster defines attic as, “A room or a space immediately below the roof of a building.”

BOCA Section 1202.1 defines it as, “The space between the ceiling beams of the top story and the roof rafters.” (Note: the Building Officials and Code Administrators International code is quoted in this article as a reference only. Other codes have similar requirements and wording. Check the code in your area for particulars).

This article deals with consideration of building code requirements when a flat roof is converted to a sloped roof (metal roofing or subframes sitting on top of the original flat roof). This approach is getting much attention, but there are special considerations. Do not assume that the sales representative of the replacement system knows the code requirements. Rarely are the special needs and requirements involved openly identified.

Ponding water has always been a problem with flat roofs. Tapered insulation, adding drains, various pumping or siphoning systems have been specified to eliminate this problem. When roofs deteriorate, replacing them usually incorporates some sort of improved method of removing water. One of the systems available is installing metal or wood frames directly over the old flat roof and installing a steep slope system of standing seam metal. While these systems are effective, they create an attic and a concealed space.

When a steeper sloped roof system is installed over a flat roof system, one of the first considerations is structural. Most steep slope manufacturers require that the new supports be attached directly to the existing supports, reducing live loading on the original roof deck itself. A structural engineer should be consulted to check out the loading.

Attics and concealed spaces are an often overlooked aspect of the Code. Here are some code requirements and other considerations.

The BOCA Code tells us why to be concerned with attics and concealed spaces in its definition for firestopping and draftstopping.

BOCA Code Section 720.0, Firestopping and Draftstopping

Section 720.1, General: “To prevent the free passage of flame and products of combustion through concealed spaces or openings in the event of fire, provisions shall be made to provide effective firestops or draftstops as herein specified.” BOCA Section 702.1 defines Draftstopping as, “Building materials installed to prevent the movement of air, smoke, gases and flame to other areas of the building through large, concealed passages such as attic spaces and floor assemblies with suspended ceilings or open-web trusses.” Firestopping is defined as, “Building materials installed to prevent the movement of flame and gas to other areas of a building through small, concealed passages in building components such as floors, walls and stairs.” “*Free passage of flame*”— that ought to get your attention.

Consider, if you will, a larger, flat building that has been covered with a steep slope roof and the large, open attic under it. Imagine what might happen if a fire started inside the open area or inside the building and spread into the attic of a building that did not meet code. The flames will have free passage to spread and the firefighters will have a tough time getting access (see below) into the attic to stop the fire. Ventilation requirements of the code and manufacturers may cause the fire to spread even faster.

BOCA Section 713.0, Floor/Ceiling and Roof/Ceiling Assemblies

BOCA Section 713.2, Continuity: “...All floor/ceiling and roof/ceiling assemblies shall be continuous without openings or penetrations except as permitted by this section...All concealed spaces and openings shall be firestopped and draftstopped in accordance with Section 720.0.”

BOCA Section 720.7.2, Attics and concealed spaces. “Attics and concealed spaces shall be provided with draftstopping as specified in Sections 720.7.21 and 720.7.2.2.” BOCA Section 720.7.2.2, Other Use Groups (other than Use Group R). “Draftstopping shall be installed in attics and concealed roof spaces, such that any horizontal area does not exceed 3,000 square feet (279 m²). Exceptions: Draftstopping is not required in buildings equipped throughout with automatic sprinkler systems installed in accordance with Section 906.2.1 or 906.2.2, provided that automatic sprinklers

are also installed in attics and other concealed roof spaces of combustion construction.”

Note: In cold climates, dry systems or antifreeze is required in the sprinkler system.

BOCA Section 1210.0, Ventilation of Special Spaces

BOCA Section 1210.1, Roof Spaces, states, in part, “Enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters shall have a cross ventilation for each separate space by ventilation openings that are protected against the entrance of rain and snow.”

Note: Some manufacturers of metal roof systems have ventilation requirements greater than BOCA to reduce the possibility of condensation on the underside of the metal roof panel. Note also the phrase “separate space.” This indicates that the attic will be divided into separate spaces.

BOCA Section 1211.0, Access to Crawl Spaces and Attics

BOCA Section 1211.2, Access to Attics: “An opening not less than 22” by 30” with ready access thereto shall be provided in any attic area having a clear height of over 30”. Where doors or other openings are installed in the draftstopping, such doors shall be self-closing and be of approved materials as specified in this section, and the construction shall be tightly fitted around all pipes, ducts or other assemblies piercing the draftstopping.”

Note: A flat-roof building that is only 50’ wide with a steep slope roof (for example, 1.5:12) installed over it, will have a clear height in the center exceeding 37”. Imagine a firefighter trying to gain entry to the attic without proper access.

Other considerations for installing steep slope systems over existing flat roofs:

1. Dewpoint —change in R value can change the dewpoint location. Moisture can condense in the original roof system, creating leaks that are not directly related to the steep slope system. A dewpoint analysis should be conducted to ensure that this does not happen. Attic ventilation, including forced air, may be needed.
2. If the insulation in the original roof system is wet and the deck is metal, wood, gypsum or cementi-

tious wood fiber, structural damage to these decks will continue if the wet insulation is not removed. Removal creates the question of where to put new insulation, as well as other questions.

3. If two roofs are in place on the flat roof, some code officials may require roof removal prior to installation of the steep slope system, and some may not.
4. Warranties — some metal roof system manufacturers issue long term warranties based on retention of color, not against leaks. Check out warranties on any system that is being considered.
5. Fire classifications of the building may change or at least may strongly influence the specification needs for the new system.
6. Complexities of raising rooftop equipment.
7. Plumbing needs to accommodate new roof slopes and rain-carrying needs.
8. Appearance changes and possible restrictions.

When considering installing a steep slope system over a flat roof, the initial cost may not be so attractive when all code and safety loss prevention needs are made part of the cost estimate.

If a designer or building owner is looking to install a steep slope roof system over a flat roof, it would be prudent to contact the local code enforcement official and/or check with the insurance carrier loss prevention engineering department to ensure that the design proposed meets all of the code and insurance requirements.



About The Author

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