Q There are two different rafter tables in the IRC code book: Live Load and Snow Load. What is the difference and how do I know which one applies?

A Victor Staley, a building official in the town of Brewster, Mass., responds: This issue of Live Load vs. Ground Snow Load might seem somewhat confusing until you read the basic premise that is identified in IRC Section R301.6, which states: "The roof shall be designed for the Live Load indicated in Table R301.6 or the Snow Load indicated in Table R301.2(1), whichever is greater."

Code requires roofs to be strong enough to carry the weight of live loads such as the weight of workers and stacked up materials (top), and snow loads (above) in areas that receive significant snowfall.

Photos: top, Dave Malloy; bottom, Steve Kuhl

Using the term "live loads" when referring to roofs might make you scratch your head initially because roofs, unlike floors, aren't asked to bear the weight of things such as furniture and occupants of a home—what you would normally think of as a live load. But when we discuss roofs these days, live loads are generally associated with the weight that the roof structure might be asked to endure while the roof is under construction or renovation (reroofing). These loads can include the construction crew and their tools, as well as roofing materials, like sheathing, roof shingles, and underlayment, that may be stacked in concentrated areas of the roof for short periods of time before they are installed and are evenly distributed (see photo, top left).

The ground snow load is pretty much what it sounds like: A predictable load situation that is derived from snowfall records over the years in a particular region (see photo, bottom left). These figures are established by the local jurisdiction, in my case the state of Massachusetts, which lists ground snow loads for each town in the state.

I find that code commentaries do a good job of explaining the basis of a code requirement, and in the case of Section R301.6, the commentary suggests that 20 psf is a pretty severe live-load condition and is most likely to be concentrated in a small area of the roof, as with a stack of shingle bundles. I take this as meaning that stacking the sheathing or roof shingles would initially concentrate the load (if stacked in one spot), rather than having that same live load acting on the entire area of the roof. Table R301.6 also takes into account that the steeper the roof, the less chance higher concentrated loads will occur. In other words, on a steep roof, less material would be stacked in a concentrated area at one time, to avoid having it slide off.

In my region on Cape Cod, we have a ground snow load design of 25 psf, which is a greater design load than the live load (12 psf to 20 psf) over an entire roof system. The bottom line is that the IRC requires you to design the roof structure to the greater roof load, and in my region, that's the ground snow load.

Q Will installing a UV light in my client's furnace ductwork eliminate bad odors in his HVAC system?

A Jeff May of May Indoor Air Investigations (mayindoorair.com), in Tyngsborough, Mass., responds: Odors from air-conditioning systems are inevitable if the cooling coil condenses water from the air and if there is any biodegradable dust on the coil or in the condensate pan. Because condensed water cannot be eliminated from the system (unless the building is in a desert-dry environment), the only way to avoid odors effectively is to eliminate the presence of biodegradable dust, which can be done only with efficient filtration (at least MERV-8, but preferably MERV-11, filters). For builders, this also means keeping sawdust and other types of construction debris out of the system completely prior to occupancy.

UV irradiation can be a very effective deterrent to microbial growth in an HVAC system, but only if the entire coil and condensate pan are fully exposed to the UV light. An effective installation requires two or more long bulbs at the incoming side of the coil that cover an area at least as wide as the coil and the pan. Typical residential units with short or U-shaped bulbs cannot irradiate enough of the coil and pan to disinfect them completely.

And the UV bulb should not be installed as a means to kill spores or bacteria in the air. In order to create an effective-enough dose of UV to kill microbes in rapidly moving system air, the UV bulb would have to be in the supply duct—and would have to be well over 100 feet long.