On the House

Sealing Fire-Stop Penetrations

Q. ***When we build homes, we drill numerous holes through wall plates and subfloor assemblies for wiring, plumbing, and hvac ducts. Are there any code requirements for sealing the gaps around these penetrations?***

A. Redwood Kardon responds: The model codes are clear about sealing pipe and cable penetrations through draft stops or fire-rated assemblies. The two codes I am familiar with, the *Uniform Building Code* (1994 *UBC*, sections 708 & 709) and CABO's *One and Two Family Dwelling Code* (section 602.7), state that fire-rated assemblies must be sealed with a noncombustible material. One such material is Flame-X (Firestops Systems, 12187 Industrial Rd., Surrey, BC V3V 3S1, Canada; 604/580-1788), a gunnable one-component sealant that meets code requirements.

This provision is intended to prevent fire-carrying drafts from communicating between floors, under stairs, or through large concealed spaces. In practice, however, many jurisdictions do not enforce this regulation when the wall cavities are sufficiently insulated to retard drafts between fire stops (*UBC*, section 708.3.1) or fire-rated assemblies (*UBC*, Table 7-B).

In many areas, local energy efficiency requirements stipulate that conditioned spaces be sealed from nonconditioned spaces. Standard sealant can be used if the penetrations are not located within a fire stop or a fire-rated assembly.

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Foundation and Framing Tolerances

Q. ***What is a reasonable degree of accuracy to expect from foundation and framing subcontractors?***

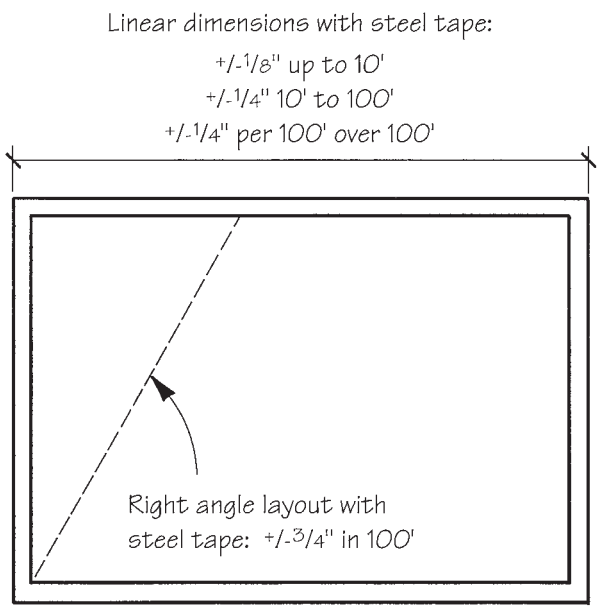
A. Carl Hagstrom responds: I had a foundation sub who always claimed that his work was within 1/4 inch. After talking to other builders in my area, I realized that he meant his work was always within 1/4 inch of being close enough. While I'm unaware of any universally accepted standards for foundation and framing tolerances, the *Handbook of Construction Tolerances* by David Kent (McGraw-Hill) lists hundreds of suggested tolerances for various phases of construction.

According to the *Handbook*, horizontal building layout (including the foundation) involves both dimensional accuracy and squareness. For measurements less than 10 feet, the tolerance is 1/8 inch; between 10 and 100 feet, it's 1/4 inch (see illustration, below). For squareness, the tolerance for the dimension of the 5-leg in a 3-4-5 triangle measured with a steel tape is 3/4 inch in 100 feet. Use the same ratio for diagonals of less than 100 feet. For example, when measuring a 50-foot diagonal, the acceptable tolerance would be 3/8 inch (one-half the tolerance for the 100-foot diagonal).

Foundations walls should be level within 1/4 inch in 10 feet, while the entire foundation should be level within 1/2 inch.

The *Handbook* states that there is no single accepted tolerance for rough framing, although a tolerance of 1/4 inch in 10 feet is frequently used and

Layout Tolerances with Steel Tape



An acceptable tolerance when laying out horizontal dimensions is 1/4 inch in 100 feet. Variations in right-angle layout should not exceed 3/4 inch in 100 feet, measured on the diagonal.

is acceptable. The second edition of *Standards for the Professional Remodeler* (NAHB Remodelors Council, available from the NAHB Bookstore at 800/223-2665) requires that walls and floors be plumb and level within 1/4 inch in 32 inches. This seems overly generous when you consider that it would allow an 8-foot wall to be up to 3/4 inch out of plumb.

In residential construction, acceptable tolerances are often talked about but seldom specified. Document the accuracy you expect and give a copy to your subs before they bid the job. That way, everyone will understand what's "close enough."

Overrated Service Panel

Q. ***Can a 100-amp service panel be used with a 60-amp incoming service?***

A. Eric Lewis responds: The answer is a conditional "Yes." The service rating for a panel comprises the amp rating of both the incoming feed conductor and the overcurrent device. Typically, overcurrent protection is provided by the service panel's main breaker or a fused switch. A service panel main breaker rated at 100 amps would trip only after the service load exceeded 100 amps. Since this is well above the 60-amp capacity of the service wire, the incoming service cable would not be properly protected.

However, if you install a 100-amp *main lug panel* and outfit it with 60-amp main breaker, the 60-amp source conductor will be properly protected. It is also important to install a retainer clip to prevent the 60-amp breaker from accidentally becoming dislodged. ■

Eric Lewis owns and operates Spectrum Electrical Services in Montrose, Pa.

Got a question about a building or renovation project? Send it to On the House, *JLC*, RR 2, Box 146, Richmond, VT 05477; or e-mail to *jlc@bginet.com*.