



Building Safety Buzz

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Structural

Questions and answers about 3x framing, plate washers and wet-setting anchor bolts.

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When is 3x framing required?

3x framing is required by the code when two pieces of wood panel are on the same piece of framing and for foundation sill plates when the allowable unit shears in the wall exceed 350 plf. Engineers will generally note on plans and shear wall schedules when 3x framing is required. Nailing patterns of four inches on center and tighter normally have a unit shear exceeding 350 plf. [IBC Table 2306.4.1 footnote I].

Is 3x framing ever required for a bottom plate sitting on a platform-framed floor?

3x framing is only required for bottom plates when the unit shear exceeds 350 plf and if there are two pieces of wood panel butting on the bottom plate and edge-nailed into it. [IBC Table 2306.4.1 footnote I].

When are 2x2x3/16 plate washers required on foundation sill plates in Seismic Design Category D?

2x2x3/16 plate washers are required for all foundation sill plates. [IBC 2305.3.10, IRC].

Are 2x2x3/16 plate washers required when I have 3x nominal sill plates?

The “2000 IBC Structural Application Guide Q & A” indicates that 2x2x3/16 plate washers are required for 3x sill plates because there is not an exception that says they are not required. [IBC 2305.3.10].

Can a doubled 2x be substituted for 3x foundation sill plate?

No. However, the code does have an exception that allows a single 2x in lieu of a 3x if the unit shear is less than 600 plf and the anchor bolts are doubled. The design engineer would determine when 3x foundation sill plates are required. [IBC Table 2306.4.1 footnote I, IBC 2305.3.10].

Can a doubled 2x be substituted for 3x wall framing?

The American Plywood Association has done testing that indicates that a single piece of 2x under each panel edge that is spliced based on NDS allowable nail capacities can be used in lieu of a single 3x. There is a draft policy in place that allows this alternative method. The design engineer needs to determine whether double 2x are acceptable for other loads and needs to design how the 2x are spliced together.

How long do anchor bolts need to be for 3x foundation sill plates?

The code requires 7” of embedment for foundation anchor bolts. For this reason 12” anchor bolts are required for 3x foundation sill plates. [IBC 2308.6]

When are hold-down anchor bolts required to be tied in place prior to grout or pour?

IBC local amendments require anchors with required embedments longer than 12” in CMU or 7” in poured concrete to be tied in place [23.15.1907.5, 23.15.2104.6]. Also, anchors need to be tied when specified on engineered plans or specifications. Anchors that are wet-set into concrete or grout need to be placed while the mix is still in a plastic uncured condition.

Cold weather concrete and masonry requirements

By Jim Stubbs, Lead Structural Inspector and Mitch Blackburn, Structural Inspector

Winter is around the corner. As of October 15, 2003 the following code required guidelines are in effect for the placement of concrete and masonry during the cold weather season. Ambient temperatures above the minimums will meet code requirements when they occur. See Handout 35 for detailed requirements.

Concrete: Cover and heat, maintain at 50 degrees for 72 hours.

CMU Cover and heat, maintain at 40 degrees for 48 hour.

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