Cantilever Code Update

by Glenn Mathewson

A new package of prescriptive deck code provisions—RB 264, which is partly based on the American Wood Council's DCA 6—was approved at the final ICC code development hearing in early October and will be included in the 2015 International Residential Code (IRC). Among the provisions are updated span tables for decking, joists, and beams, which will help clarify the rules for cantilevers of joists and beams.

Joist Cantilevers

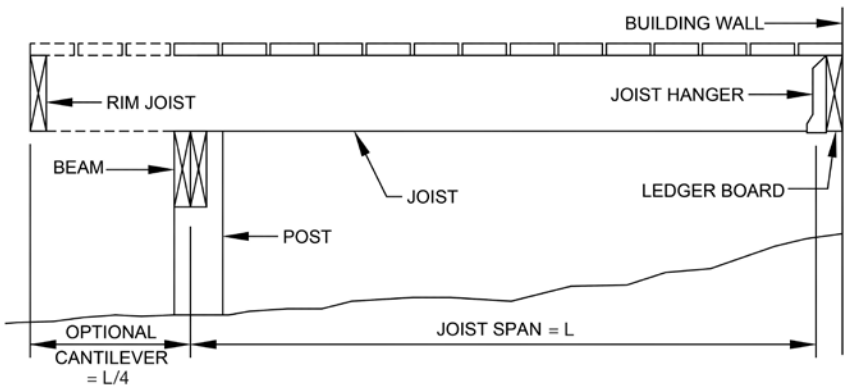
According to the new span tables and IRC provisions, cantilevers can extend up to one-fourth the backspan of the joist. This means that joists, such as southern pine 2x10s at 16 inches on-center, spanning 12 feet are allowed to cantilever up to an additional 3 feet (see illustration, below).

There are two sections in the new span table: one for joists with cantilevers, and one for joists without cantilevers. Cantilevering a joist produces greater stresses in the primary joist span (backspan), so the maximum span is often reduced. For cantilevers greater than the depth of the joist material (9¼ inches for a 2x10), you must use the span criteria for "joists with cantilevers."

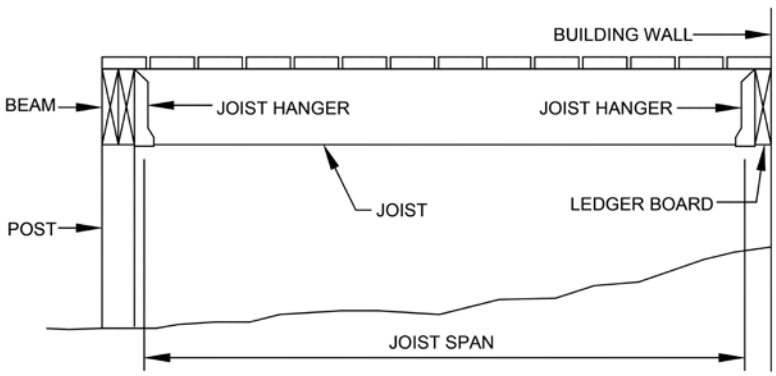
These joist span tables and cantilever allowances might be old news to those familiar with DCA 6 (awc.org), but there are a few differences. For example, under the portion of the joist span table for joists without cantilevers (and thus a longer allowable span), joists are still allowed to cantilever up to the depth of the joist material. This will allow for minor adjustments to beam placement, without affecting the maximum span.

Another difference is that the current IRC requires full-depth blocking over the beam when joists are cantilevered beyond, while DCA 6 does not address this. The new IRC provisions strike a balance, requiring blocking over the beam when joists cantilever, but allowing the blocking to be cut to 60% of the joist depth to accommodate deck-drainage systems that install within the joist bay.

Meanwhile, the AWC is poised to include a revised and more user-friendly joist and beam span table in the 2012 version of its DCA 6, expected next year. Instead of separate tables for non-cantilevered and cantilevered joists, a single proposed table provides maximum joist span and cantilever distances for all conditions, which should simplify joist specification without compromising design freedom.

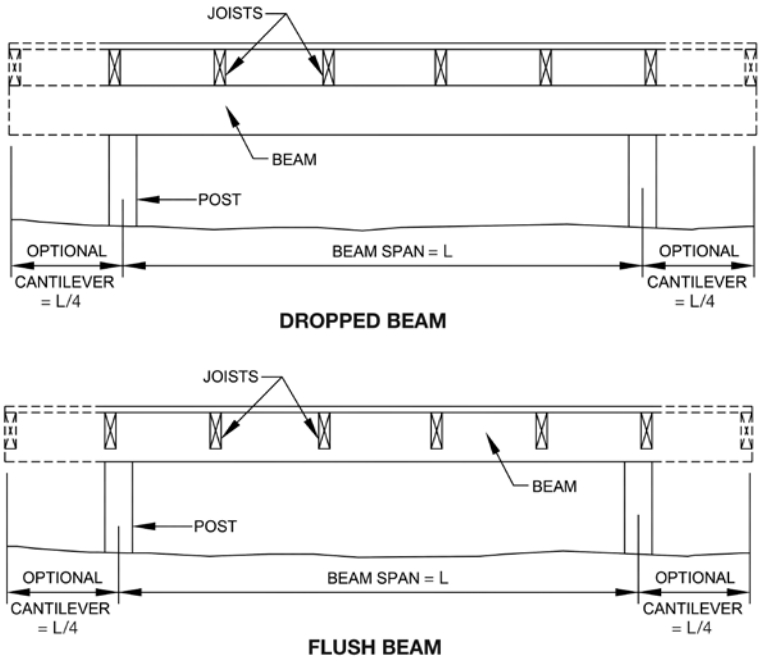


JOISTS WITH DROPPED BEAM



JOISTS WITH FLUSH BEAM

The 2015 IRC will contain separate span tables for joists with cantilevers (top left) and joists without cantilevers (bottom left). As shown in these ICC drawings, cantilevers up to one-fourth the span of the joist are permitted, with the cantilever distance (or overhang) measured from the center of the supporting beam to the outermost framing material, typically the rim joist.



Dropped (top) and flush (bottom) beams will be allowed to cantilever beyond their supports by a distance equal to one-fourth the span between supports, as shown in the above ICC illustrations.

Beam Cantilevers

Similar to joists, beams can cantilever up to one-fourth their backspan. However, unlike with joists, there is no need to use a different column in the table for these conditions. The stresses in the backspan portion of the beam are considered whether there is a cantilever or not. A southern pine (2) 2x12 beam can span 8 feet when supporting joists spanning a maximum of 14 feet, and it can cantilever 2 feet beyond the posts on each side. With the allowable cantilever of the joists, this beam would support a deck 12 feet by 17½ feet.

While it will be years before the 2015 version is widely adopted by local codes, many building officials often accept future provisions like these as easy-to-approve alternatives to costly engineering. ❖

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