

## Why Is Diagonally Bracing a Center Post a Bad Idea?

**Q** To differentiate my company from our competitors, I like to explain to our customers that we go “beyond code” when we build decks. For example, my company typically includes diagonal bracing at each post, which I feel results in a much stiffer deck. But recently I noticed a note to Figure 10 in DCA 6 that prohibits diagonal bracing on center posts. Why is this a bad idea? On a wide deck with multiple intermediate posts supporting the beam, would it still be true that only the corner posts should be braced?

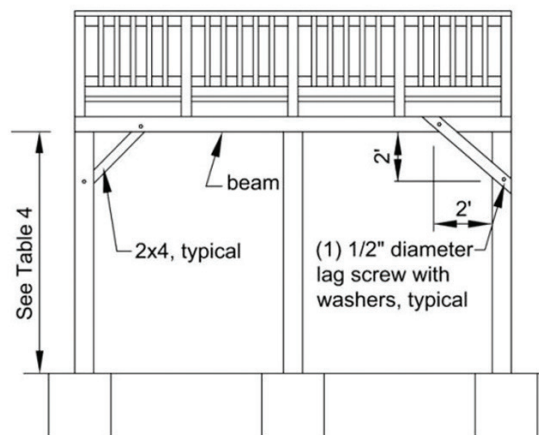
**A** Andrew Wormer, *PDB* editor, responds: To get an answer to your question, I reached out to the American Wood Council, the organization that publishes DCA 6 (the *Prescriptive Residential Wood Deck Construction Guide*). According to Loren Ross, who is the manager of engineering research with the AWC, the prohibition in DCA 6 against diagonal bracing on center posts is to address concerns of potential overstress from lateral loads on the center posts, which receive more vertical load than the posts at the corners.

I was a little skeptical, so to get an independent third-party perspective on this question, I also contacted Paul Bennett, who is principal engineer office director for Exponent, an engineering and scientific consulting firm in Denver, Colo. When I asked Bennett if he thought bracing the center posts to make the deck feel stiffer would actually put those posts at risk of buckling, his answer was a little surprising to me. He said, “We ran some sample scenarios and concluded there is concern with bracing—which supports the AWC comment to not brace it.”

According to Bennett, the issue is that although a braced column’s buckling capacity is increased (because the bracing effectively makes the column shorter), it also is susceptible to increased lateral loading due to wind loads. So while a braced post results in a stiffer deck, the post will be more susceptible to buckling under wind loads, which are very specific to each deck’s geometry and location.

Are wind loads really a concern on a deck? Research by Don Bender, an engineering professor at Washington State University, suggests that even storm-force winds don’t create particularly high loads on decks (see [deckmagazine.com/design-construction/framing/wind-loads-and-decks\\_o](http://deckmagazine.com/design-construction/framing/wind-loads-and-decks_o)). But

**Figure 10. Diagonal Bracing.**



**DIAGONAL BRACING PARALLEL TO BEAM**

**Note: Diagonal Bracing is prohibited on center posts.**

**Because center and intermediate posts carry higher vertical loads than corner posts, they should not be diagonally braced, according to Figure 10 in DCA 6, the *Prescriptive Residential Wood Deck Construction Guide*.**

as Bennett pointed out, there could be many different loading scenarios, with no one-size-fits-all solution, which is why AWC makes this recommendation against center-post bracing. “The bottom line is that every situation and deck is unique, which is why a deck builder should really consult with an engineer when in doubt (I know that’s not an answer anyone wants to hear). In this case, I think AWC is erring on the side of caution (as would I), since a deck failure could potentially result in the loss of life,” said Bennett.

When installing diagonal (or “knee”) bracing on those corner posts, remember to follow DCA6 guidelines, in which the brace is fastened to the post and the beam with 1/2-inch-diameter lag screws (or the equivalent), with the fasteners placed at least 2 feet away from the post-to-beam intersection, as shown in Figure 10 in DCA 6 (see illustration, above).

## Is There a Way to Prevent the Ends of Composite Deck Boards From Swelling?

**Q** When I installed the capped composite decking on my clients' 30-foot-wide deck, I needed to use butt joints. Since then, my clients have noticed a slight swelling at the ends of the deck boards where the butt joints are located. Is this normal?

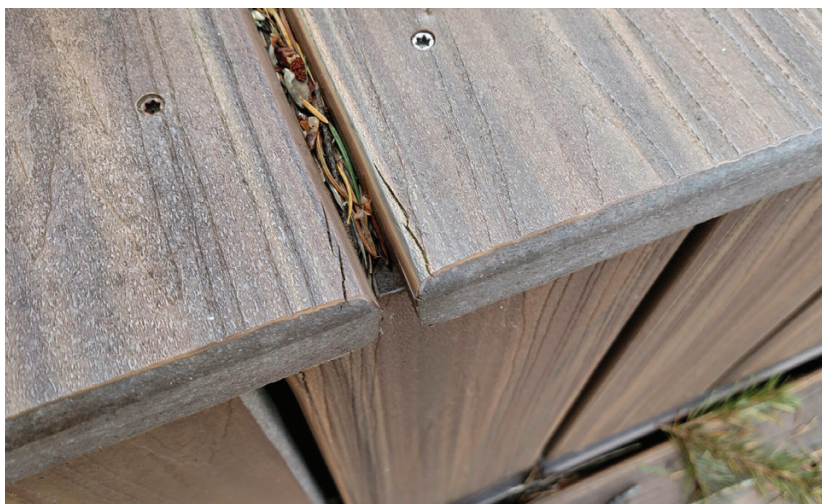
**A** Kim Karwijk, a deck builder in Olympia, Wash., and a *PDB* contributing editor, responds: I recently encountered a similar situation with a project that I had installed a few years ago. Because I don't believe that decking should swell after it has been installed, I contacted the decking manufacturer to file a warranty claim. Even though I've installed thousands of lineal feet of this particular product with virtually no problems (and good customer support the few times when there were), my conversation with the company's tech department reminded me that it always pays to carefully read each deck manufacturer's installation instructions.

For this particular capped composite decking, the instructions call for 1/16-inch-end-to-end spac-

ing between boards for every 20°F increment, to account for shrinking and swelling caused by temperature changes. So, for example, if the decking is installed on a 50°F day, at least a 1/8-inch gap would be required in anticipation of the days here in the Pacific Northwest when temperatures soar into the 90s. Of course, temperatures here in the winter dip into the 30s and lower, in which case the gap could reasonably be expected to grow to 1/4 inch or more.

These gaps—while perhaps unsightly—aren't necessarily a bad thing, because they allow water to drain away from ends of the boards, which aren't protected by the caps that protect the sides and tops. However, pine needles and other organic debris can become trapped in the gaps and hold moisture, which can then be absorbed into the ends of the boards. And make no mistake: Most composite decking absorbs moisture when exposed to enough of it, which is why the ends will swell (**Figure 1**).

Another often-overlooked detail is the recommended placement of end fasteners. Again, for this particular decking, end fasteners aren't permitted



**Figure 1.** Butt joints in composite decking that aren't properly gapped to allow for expansion can lead to swollen ends (above left). When the break occurs over a single joist, it's impossible to drive fasteners vertically into the joist so that they are perpendicular to the board face while maintaining proper clearance from the ends. Organic material that collects in the gaps between deck boards will trap moisture that can be absorbed by the decking (above right).

PHOTOS: KIM KATWIJK



**Figure 2.** You can avoid the need for butt joints by installing a seam board in the middle of a wide deck. Here, California deck builder Michael Walter used shims to create consistent gaps between the seam board and the ends of the deck boards.

within  $\frac{3}{4}$  inch of the end of a board, and must be installed perpendicular to the board surface. So, even without the required gap, a 1½-inch-wide single joist just doesn't offer enough surface area to fasten the ends of two deck boards without angling the fasteners in toward the center of the joist. That means that a doubled joist should be installed wherever there will be a butt joint. That's a costly measure for deck builders (like me) who like to randomly locate the butt joints, instead of lining them up along one or two joists. It also creates a wider platform for collecting and trapping moisture and debris.

Unfortunately, there's no easy solution. My manufacturer suggested regular removal of the debris in the gaps to help reduce the swelling, but that's impractical in my area—where trees are almost continuously shedding their needles—and it's a maintenance burden for the homeowners. Another option is to install a seam board that interrupts the long run of decking and eliminates the need for butt joints (**Figure 2**). If you use this detail, you'll still need to provide a proper gap per the manufacturer's recommendations between the ends of the decking and the edge of the perpendicular seam board. ♦