STRUCTURAL BUILDING COMPONENTS MAGAZINE
January/February 2005

SUPPLEMENTAL SUPPORT DOCS:
Jay also responded with a discussion of the required strength of connections between roof diaphragms and walls. He presented an alternative capacity-based design method for shear blocks. To read the complete response from Jay Crandell, see Support Docs: January/ February 2005.

Readers Respond

"Heel Blocking" by Rachel Smith

Brad Crane, P.E. of Shepard Crane & Associates (SCA) in Houston, TX commented on the Heel Blocking Technical Q&A (August 2004):

> *The statement that heel blocking is required only in the western united states gives the indication that only earthquakes generate forces which require these blocks, when it can be clearly shown that wind forces can meet or exceed these seismic loads at the roof levels. this statement also contradicts where the international building code (ibc) specifies that lateral forces shall be transferred from the roof diaphragm to the braced wall by blocking of the ends of the trusses. (see ibc 2308.3.2.1 exception).*

Brad is correct; earthquakes are NOT the only lateral loads that may make blocking necessary. However, lateral loads do not mean blocking is required. The IBC 2308.3.2.1 Exception states, "Where roof trusses are used, lateral forces shall be transferred from the roof diaphragm to the braced wall by blocking of the ends of the trusses or by other approved means." Coincidentally, Jay Crandell of Applied Residential Engineering Services (West River, MD) responded with some ideas on what "other approved means" would qualify. In part, he said:

> *There is considerable capacity to transfer shear from conventional (unblocked) roof diaphragms without the use of blocking. Simple hurricane clips can be used not only to improve wind uplift resistance, but also to increase the shear transfer (in plane of the wall) through the truss-wall connection system. Testing has shown that adding a typical metal "twist clip" to this joint practically doubles the shear transfer capacity of the conventional toe-nail connection without blocking from 280 plf to about 580 plf which is near to the capacity of a typical unblocked conventional roof diaphragm. The reference for these findings is "Roof Framing Connections in Conventional Residential Construction" available through the U.S. Department of Housing and Urban Development (www.huduser.org).*

Even so, blocking and truss-to-bearing connections remain within the realm of the building designer's responsibility. Brad continued:

> *Why is it that the truss engineers do not indicate on their drawings that heel stability bracing is required when the 2000 IBC states in Section 2303.4.1 Truss Design Drawings, Item 18, that truss construction documents are to show*

"Required permanent truss member bracing locations." Since truss designers never show a bracing requirement at the heel, the obvious conclusion is that no blocking/bracing is required.

It's true that truss designers could do a better job of pointing out on the truss design drawing that permanent bracing and blocking is required in order for their truss design to remain in-plane and in-plumb, but this does not make them responsible for specifying the design of bracing and blocking. If a building designer feels strongly that permanent bracing and blocking need to be called out on the truss design drawing, they can certainly ask the truss designer to add a note that states something similar to "Refer to the structural framing plans for permanent bracing and blocking details." That way the installation crew would have a direct link from the truss design to the building designer's permanent bracing design.

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