

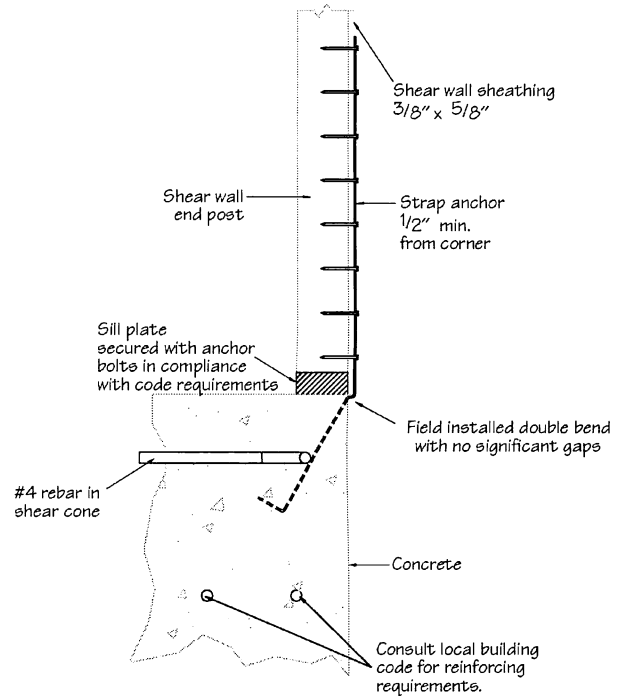
September 7, 2005

Re: USP's HPAHD and STAD Series Strap Anchors Installed over Shear Wall Diaphragm Sheathing

To Whom It May Concern:

USP's HPAHD22, STAD series and other similar strap anchors are designed to embed in cast-in-place concrete for subsequent attachment to structural framing members to resist uplift forces. This includes uplift forces on the end post or end studs of shear walls. These products are designed with the intent that the vertical strap-portion of the strap anchor emerges from the concrete vertically. However, it is not uncommon for the anchor to be field bent horizontally to wrap under the shear wall diaphragm sheathing and then bent vertically up the side for fastening (see attached profile sketch). The diaphragm sheathing thickness may be between 3/8- and 5/8-inch. Although not an uncommon practice, this installation is not what was intended, and the performance of the product is different than indicated in USP literature and in pertinent evaluation reports.

Nevertheless, assuming the strap anchors are installed over the diaphragm sheathing so the two field-added bends are tight against the bottom edge of the sheathing, with no significant gaps, and without significant spalling of the concrete, and assuming the strap anchors are installed in every other respect in compliance with USP literature, then the allowable load value of the strap anchor remains the same. Note the straps shall be bent only once at any given point; bending the strap more than once will fatigue and may fracture the steel, and will reduce the strength of the strap. The sill plate shall be properly secured with sill bolts in compliance with code requirements.



However, the vertical deformation or displacement of the secured framing in this application will most certainly increase when uplift forces occur, especially as the thickness of the diaphragm sheathing increases, as compared to the intended application of the strap anchors. The vertical displacement is a direct result of the "unfolding" of the tine hinge created by the introduction of the double field-bends. Subjected to an uplift load, the framing to which the reconfigured strap anchor is fastened may displace 1/32" to 1/2" vertically, based on calculations and depending on the specific strap anchor involved, the magnitude of the load and the specific installation configuration. If there are significant gaps between the strap anchors and the wood members in the area of the field-bends, the vertical displacement will increase even more.

The effect of any vertical displacement of the end of the shear wall increases the horizontal drift of the top of the shear wall. The structure is probably designed for a specific limited amount of horizontal drift in accordance with building code requirements. In consequence, it is imperative to consult the structural designer or engineer-of-record to determine if the increased vertical displacement of the strap anchor so installed is acceptable in light of the originally intended design.

Sincerely,



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