



## Technical Bulletin

No	729
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Date	12/19/07

### FASTENER LOCATION FOR SCREWS AND NAILS

We get a lot of questions on the proper location of nails and screws on exposed fastened panels. Fabral's position is that nails must be installed thru the top of the ribs and screws must be installed down in the flats of the panels on exposed fastened panel systems.

To clarify the reasons for this, nails are more difficult to seal and as a result must be installed with thicker, flexible washers up on top of the panel ribs. This way they are up out of the water line. At this location, when the panels expand and contract with temperature changes the nails will bend slightly to allow for this movement. Nails are flexible enough to allow for this movement.

Screws, on the other hand, have a very thin washer that must be properly compressed in order for them to seal properly. This is very difficult to do if the washer is installed in the top of the rib. Also, if over driven in an attempt to properly compress the washer, the ribs can actually become deformed and the panel pan can bow upward. Additionally, screws are not as flexible as nails and with thermal expansion and contraction a screw attached thru the top of the rib will tilt back and forth and will oblong the screw hole, reducing the wind uplift pullout resistance of the screw from the wood.

A properly installed screw will be down in the flat of the panel. At this location the metal panel has solid wood right below the metal panel and good compression on the washer can be obtained. With thermal movement in the panel, the screw will be put into shear, not bending, and the hole thru the metal panel will slightly elongate. As long as this slot does not exceed the diameter of the washer, the hole will remain sealed. This is why we limit the panel length for aluminum exposed fastened panels to 16' and limit steel exposed fastened panels to about 40'. Additionally, the diaphragm shear capacity and shear stiffness is based on the screws being installed in the flat of the panel. If screws are installed in the top of the rib, the diaphragm would be much more flexible and would not be as strong.

In conclusion, nails should be installed thru the top of the ribs and screws should be installed in the flat of the panel.

See next page for detail.

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