



Filling in the voids

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Tricky Combinations

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Prestressed hollow core plank work great to provide open clear spans in many conditions, but how they work in an overhang or cantilever and how the interior portion of the plank, the back-span, influences and is influenced by that overhang is interesting

In order for those long, clear spans to work hollow core is asymmetrically reinforced with a far greater proportional number of strands in the bottom than the top of the unit cross section. Those strands are always working hard to pull the unit upward creating both camber and load capacity. But when the plank extends past one or both end supports, those same strands are now working to pull the overhanging portion down which is clearly not optimal.

So how do you offset or counteract that? Adding strands to the top is one solution, but it has a fairly steep price to pay. Typically all strands are tensioned to a fixed value therefore every strand added to the top has a canceling effect on one in the bottom. Fewer effective strands in the bottom means less capacity and consequently shorter available clear span limits.

It is possible in some types of prestressed members to 'shield' selected portions of the strands both in the back-span and cantilever thereby utilizing the sections that work to your benefit and negating the sections that don't.

Unfortunately, most machine extruded hollow core plank don't have that capability, so we have to take the good with the bad. The very same fully bonded strands that work so well in our favor for clear spans, work against an overhang.

Adding to the complexity, the mass of the overhang doesn't help like it might in a traditionally reinforced situation, but then again most traditional reinforcing designs aren't going to yield the span distances achieved with prestressing. It's just a simple product trait and one that designers need to be aware of.

Once again, falling back on the resources and knowledge of your local prestressed manufacturer and their specialty engineering and technical sales staff will help insure a successful outcome to your project.