Filling in the voids

Volume #13

Elevated floor block loading

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The use of wood framing for the second level, above the first-floor block walls, in most single family residential production home construction is pretty much an industry standard in this part of the country. The most obvious reasons such a technique has been adopted are cost/economics, ease, tradition, and the desire for low complexity. But a couple of other key concerns exist, such as staging a second level of masonry on a second-floor deck (which in production homes is often wood truss framing), and the related concern about the loads involved.

However, being in a trade where multiple levels of masonry construction is the norm, I know that multi-level block construction is not only possible but is, in many cases, ideal. Prestressed hollow core concrete planks can typically handle such loads without much concern if done properly which, it turns out, is a key benefit of a precast deck.

It's not likely or feasible for most production home builders to switch the second floor of every house under construction in America to precast. That probably wouldn't pass the cost/economics test, nor does the capacity exist to meet the demand, and honestly most production home builders aren't equipped to include commercial techniques in their processes. However, many custom home builders are and do use precast in their projects. It offers many benefits that high-end clients appreciate and are willing to pay for, and that's an important take-away. But what about the how, when and why for staging block on a hollow core deck?

Concrete is heavy stuff generally and concrete masonry units (CMU as they are known) are no exception. A regular concrete block wall ten feet high and just six feet in length weights as much as your car; and when a single cube of block is hoisted onto a deck it weighs just about the same amount. Next consider that the same cube measures about 4 feet square, and when divided out that comes to over 200 pounds per square foot. If it were just placed up there as delivered, and add to that the fact that multiple cubes (sometimes many multiple cubes) will be needed, you can see where weight might become an issue.

So, the solution is simple, and if done well, only slightly labor intensive; it's a must to 'break down' the cubes spreading the load and also serving to get individual blocks closer to where they will be needed by the masons. Ideally there would be several locations along or around the building to make the distance any one worker has to move a block as short as possible, but that sometimes isn't possible. Therefore, a single cube is either hoisted just above the edge of the deck and unloaded from equipment forks, or at most one single cube is placed on the deck as close as possible (preferably directly over) a load bearing support transferring the load down to the foundation and then individual blocks, or perhaps very small loads, are distributed from there.

Unfortunately, the blocks themselves aren't the only material a mason needs to build a wall. Bags of Portland cement (perhaps a pallet), a large pile (or bag) of sand, reinforcing bars, and a portable mixer for making mortar are also needed, plus the masons, tenders and their tools. Add to that the scaffolding also likely for the masons to work from when raising the wall to the finished height and the load compounds quickly.

As you can see the means and methods of something seemingly simple and unadorned as a CMU wall take careful consideration. Typically, a hollow core deck has a bit more capacity than the design load requirements, but as a rule design loads should never be exceeded without consulting the precast manufacturer.