

MANAGING RISKS WITH HIGHLY REACTIVE SOILS

Heaving slabs have caused grief for many homeowners who bought new homes built over highly reactive clay sites. Previously avoided, these locations are being built upon because of a shortage of available and affordable land close to burgeoning cities.

Suffice to say, adequate building performance is achievable, as long as its design fully complies with a myriad of conditions, such as accurate soils analysis, consideration to proximity of trees, adequate drainage and earthworks, careful slab construction, and so on.

Compounding matters, building to minimum standards does not necessarily equate to meeting customer expectations. For example, some may argue that the tolerable limit for differential slab deflection in AS 2870:2011 Residential Slabs and Footings (which is span/300, up to 40mm max, where walls are timber framed) is a little excessive, because amongst other things, I have seen internal walls and skirting boards lift off the floor! (bottom right).

Of course, one could build to a higher specification at greater cost. Alternatively, it could be a simple matter of risk management, i.e. choosing a safer option, such as building a timber floor on stumps instead of a concrete slab. But these are matters for the developer and builder to work on, and well beyond the control of the truss fabricator. So what can fabricators do to mitigate risks without blowing the budget?

The main complaint that is often made concerns crushing of cornices on internal walls. Cornices are meant to be fixed in a way that permits it to slide, but we know that's rarely done properly. Furthermore, internal wall brackets are meant to be lightly nailed to trusses so they slide, but some inexperienced apprentices overzealously fix them too tight. The builder has to take some responsibility in these areas.

What the truss industry can do is to provide regular installation training for our builder customers. Better education, better knowledge, and better understanding of installation requirements, lead to fewer mistakes, not only in this issue but in every area. It also enhances your relationship with your customers. The engineers from your nailplate supplier are a resource you can call upon to deliver training. MiTek's truss installation course for apprentices, builders, carpenters and supervisors include a workbook and assessment, which if successfully completed, also awards the participant with an accreditation card.

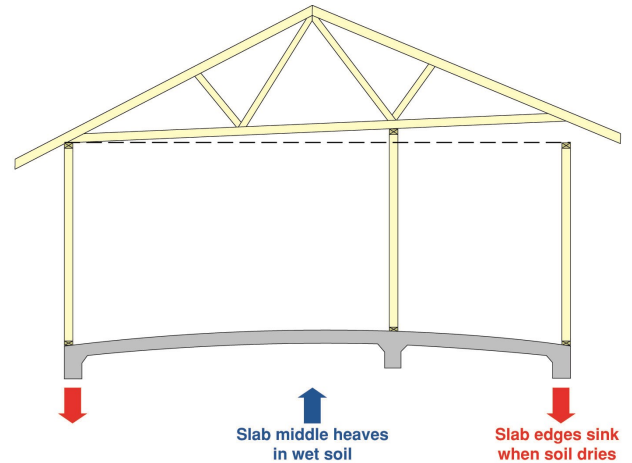


The other thing we can do is to supply internal wall brackets that are more tolerant to movement. Internal wall brackets which have elongated slots that allow nails to be installed in the middle of the slot, will accommodate not only truss deflections, but also upward and downward movements of the slab as well.

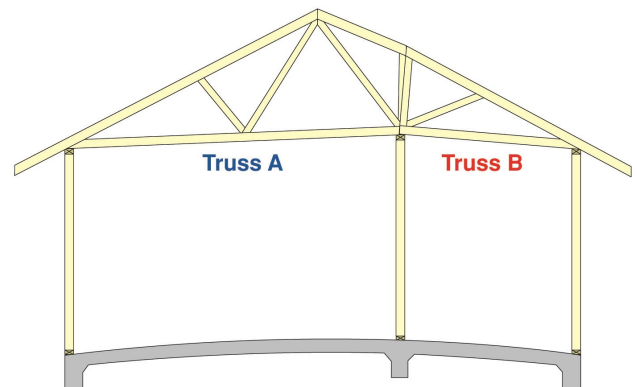
Finally, if internal loadbearing walls are required, their use can also be made less risky. Where a truss has three or more support points, it is vital that all support points are, and remain, at their required levels, because that's their design assumption. If the slab heaves in the middle, the truss will also be lifted up and teeter about the internal loadbearing wall. If the edges of the slab heave, the truss will be lifted off its internal support and become clear spanning instead. Either way, it changes the stress distribution in the truss, and will likely lead to overstressing some members or components.

A better, safer way of utilising internal loadbearing walls is to separate an internally supported truss into two simply supported (half) trusses. In that way, the trusses will be free to move along with the supporting walls should they heave or fall, without significantly affecting its stresses.

Thankfully, most truss strength problems caused by heaving slabs rarely lead to failures, and any detected overstressing is readily remediable. But fabricators will be better protected by employing risk management to provide truss solutions which are unaffected by poor construction on highly reactive clay soils.



Single Truss with Multiple Supports



Multiple Simply Supported Trusses



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