

## Building Stronger Foundations Discussion Paper

### A Structural Engineer's Point of View

As a Chartered Structural Engineer who has been involved in the construction industry in the UK and Australia for more than 40 years and who now operates as a sole practitioner, I believe I can bring a slightly different perspective and experiences to the discussion.

Arriving in Australia a little over 10 years ago I was astounded to find that structural engineering practice was to provide only drawings of intent and that detailed design was the responsibility of the builder or principal contractor also, with the exception of member sizes, the drawings were devoid of any dimensions this apparently being the domain of the Architect.

This led me to ask some questions to which I have never received satisfactory answers namely:

- ❖ How can you have confidence in the validity of your computations if you do not have control of the position of the structural elements comprising the building? I have encountered situations, particularly in reinforced concrete construction, where an Architect has arbitrarily moved a beam laterally which has induced additional forces in the supporting columns compromising its adequacy.
- ❖ The first time an Engineer will see the builder's reinforcement design is 30 minutes before the concrete arrives not giving time to look at splice locations, corner and step details etc consequently, what is the point of carrying out a site inspection of something a) you have not designed in detail and b) you have no control over?
- ❖ How does the steelwork fabricator know how to design a connection if you do not provide him with the forces?
- ❖ It seems that engineers endeavour to minimise their exposure by sheltering behind providing a limited scope of service. Given that an Engineer does not undertake a "full service", what is the extent of an Engineer's liability?
- ❖ How can a Certifiers be independent when they are appointed by the commissioner and/or constructor of the building?

From my observations it would appear that builders use the provisions of "performance solutions", as available in the NCC, to pare back the original design intent documentation solely for the purposes of improving their profitability and then 'cajole' the designers and Certifiers into accepting those solutions; I would suggest this is ethically questionable.

I believe it is necessary to remove the constructor from the design process and for the design professionals to provide a "full service", this will undoubtedly be strongly resisted by all parties with some claiming it will push up costs and others concerned that they will now be accountable; to me this is a reasonable price to pay for a system where each party under takes what they have been trained to do and can be held responsible for their actions.

On the basis of the above I provide the the following answers to your questions.

1. All, that way there is no confusion.

2. No. There would be too much pressure to declare when time is required for careful consideration.
3. All changes to structural configuration and/or construction materials.
4. All, that way there is no confusion.
5. Diligence and compunction.
6. Wet signature site instructions by the relevant Principal Designer.
7. Undertake design before construction commences or if “fast track” is necessary then there should be a minimum margin in the design.
8. Locked PDF
9. Plans, elevations, sections, details and specifications.
10. The current provisions are unnecessarily complex, the BCA needs to be less antagonistic. It is recognised by many that certain Australian Standards have failed to keep pace with developments in the understanding of the behaviour of materials and in the introduction of new materials consequently, the BCA should add specific EU and US codes to the DTS list.
11. Not applicable to structural engineering.
12. See 10 above.
- 13, 14, 15 & 16. The principal contractor is responsible for the construction of the building and must adequately supervise its subcontractors so as to ensure compliance with the CC documentation and must not be allowed to divest responsibility.
17. Engineers must be on the NER with Engineers Australia or the Institution of Structural Engineers as certification bodies i.e. CPEng, CEng etc.
18. Any whose work could have a negative impact on the building, its occupants, the public or the environment.
19. see 17 but also, it is important that registration in one jurisdiction needs to be recognised in all jurisdictions without caveats or supplementary requirements.
20. Professional indemnity insurance at a level commensurate with the risk and to the comfort of the client should be provided by the designer however, that insurance should not be transferrable to 3<sup>rd</sup> parties without the express permission of the designer.
21. See above.
- 22 & 23. See 17.
24. A minimum of 30 hours of documented CPD per annum.
25. Investigative only. There should be no powers of entry unless accompanied by a search warrant.

With regard to duty of care, this is undoubtedly a legal minefield upon which I would not wish to comment. That said, the indemnity insurance carried by designers should not be laid bare to the whims of vexatious litigants.

signed

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