



BRACE ON - CRASH ZONE

In our industry; we make sure all vertical loads are transferred to the ground safely. But what about lateral loads occurring from wind, snow or seismic forces? This is another component in our work; which needs to be included to make the designs compliant. **The design for lateral stability.**

While Australian Standards such as AS 1684 and AS 4440 come to our aid; they fall short while addressing the complexity of modern structures where wall on wall is no longer the trend. With modern concepts of open spaces, we need further help. We have two pathways from here forward.

Engineered Bracing Designs:

Ask your builder/contractor/client to provide you with **Engineered Bracing Designs**. Once you receive the plans; make sure the plans DO NOT carry any disclaimers such as "Bracing Plans Representative Only" and ARE NOT done by the builder's designer who; more than likely; is not an engineer.

Many councils across Australia don't seek structural designs of residential project for approvals. In such cases; builder expects the frame designer to take care of lateral stability of the structure.

Engineered Bracing Plans may have a few pitfalls. Simply because the consulting engineers don't know who these plans would land up with for supply and as we know; we all have our own stock lists.

P1: Consulting engineers often design for JD4 group timber wall frames to get maximum capacity out of bracing walls. However; most wall frames use F5VGS or MGP10 which is a JD5 group timber. AS 1684 clearly marks down the capacity of wall bracing by 12.5% to 16.0% for JD5 group of timber. To avoid non-compliance; this change must be approved by the design engineers.

P2: Consulting engineers often recommend portals and 6.4kN/m or higher capacity bracing walls in upper levels of projects. Curtesy; open plan livings and huge glass facades. Such bracing elements create massive tie down and punching forces in the floor systems. Regular flooring systems can withstand only up to 3kN/m capacity bracing elements. Anything more than that needs specific floor design from engineers.

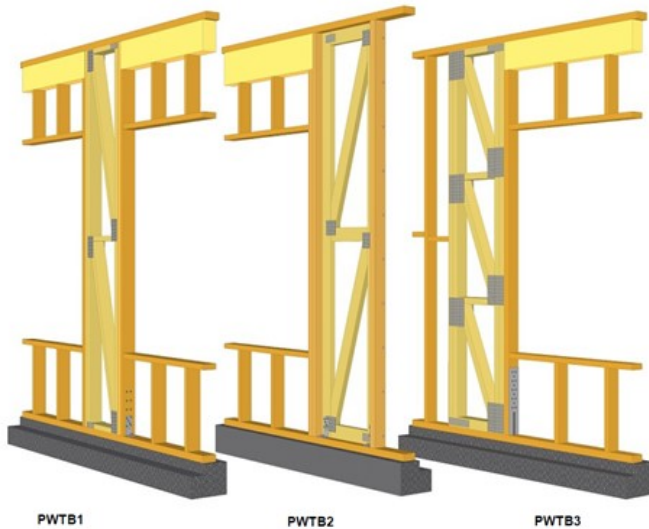
P3: Commercial projects would invariably have engineered bracing designs which would have specific requirements. These requirements MUST be incorporated in frame and truss system design.

Consulting engineers often require diaphragm action from the roof system. Builder however; chooses to use clip on furring channel ceiling to achieve better levels. These practices are not compatible. Clip on ceiling channels DO NOT offer diaphragm action.

Fabricator must explicitly ask both the consulting engineers and the builder what they expect out of roof system and what their intension are on site; because this might have major implications on wall frame and roof/floor system design.

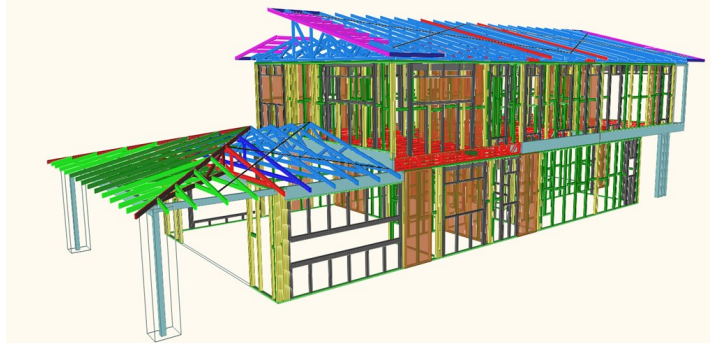
Design Software:

Most current design software's address lateral stability design. That however; does not guarantee compliance with complexity in project plans. Reach out to your Timber Design Engineer for assistance.

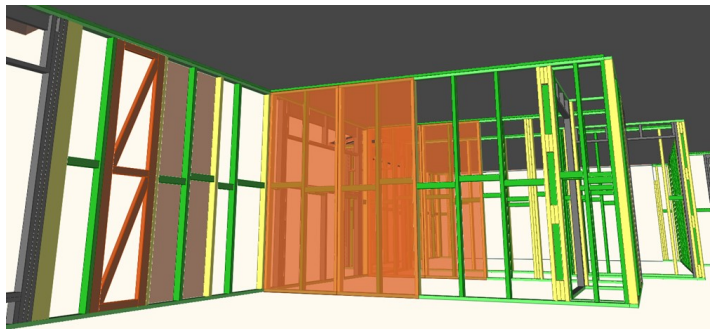


Above: Pryda Wall Truss Brace

Pryda Build; for instance; allows fabricators to model and design structures including design for lateral stability. Various standard bracing elements including ply bracing walls as recommended by AS 1684 and proprietary systems like Short Wall Braces and Pryda Wall Truss Brace can be used for tricky floor plans.



Above: Whole of the House Bracing Design Image



Above: Pryda Wall Truss Brace in Wall Frames

Talk to Timber Design Engineer about Trussed Timber Portals and Ceiling X-Braces to get your projects across the line as required.

Remember to CLEARLY note in your certification your SCOPE OF WORK including what's NOT been done by you. Structural compliance and certification are CRITICAL. Numerous parties come together to complete a project. It is imperative to have a clear line of responsibility. Active communication with builders, their designers and engineers at early stages of design is the key to success.



This edition of FTMA Tech Talk was written by Varun Bharti, QLD Senior Structural Engineer of our Gold Sponsor, Pryda.

If you have any questions for Varun, please don't hesitate to contact him.

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