A Case of Camber and Gravity

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Leaving the Autumn chill of Melbourne, it was a pleasant to arrive in Brisbane for the recent GLTAA meeting. The dinner and meeting was attended by representatives of Australian manufacturers as well as Associate members from New Zealand and Europe. The GLTAA has some exciting initiatives 'on the boil' at present with announcements pending. It was agreed that future meetings be expanded to facilitate increased input from associate members as well as the provision of a specific forum for addressing manufacturing challenges. The next meeting will be held in Melbourne in September.

One of the pleasures of networking in the context of an industry association is the exchange of anecdotes with people working in similar fields – if the anecdote is shared over a good meal and a fine drop – it's all the sweeter, though I hasten to add – no less accurate!

A familiar story relayed on such occasions and one all manufacturers have their own versions of now involves one potential ramification of supplying precambered beams to the market.

A little background first; Glulam beams can be supplied by manufacturers as either 'cambered' or 'straight'. The industry standard camber is a 600m radius which provides a slight curve in the beam which is mostly eliminated once the load is applied. A good 'carpenter's eye' will easily pick the topside of a beam, however a 600m radius is very gradual. As an example, the mm rise at the chord midpoint to the underside of the beam is in theory, only 2.2mm on a 3.3m long beam, 8.1mm on a 6.0m long beam and 29.6mm on a 12.0m beam. Notwithstanding the likelihood of most carpenters installing beam correctly, GLTAA accredited manufacturers mark the topside of the beam with a sticker or inked pattern.

My version

So… to my version of the manufacturers common story about a cambered beam. The Hardwood Glulam beam had been supplied at a size of 480x85 with a length of 7.2 metres. It was supplied cambered which at this length should have given a rise at the midpoint of 10-11mm.

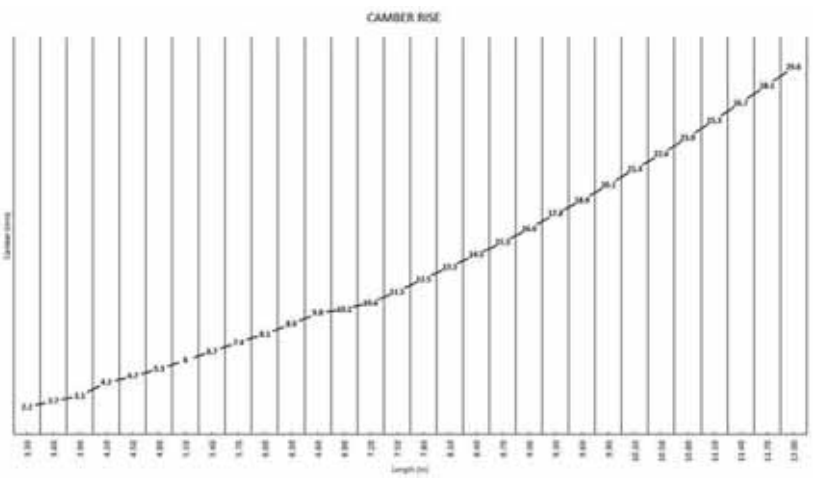
Called to a site meeting, I beheld the beam now installed and spanning an open living space in a beautiful house that was now rapidly progressing to lockup stage. An inspection had revealed that the beam was 'sagging'. Engineers had raced to double check the size, span and relevant loads, but everything suggested that the beam was well within its capacity.

Representatives of the builder, the carpenter who installed the beam, the wholesaler through whom the beam was supplied and now the manufacturer were all present. I was quickly informed of the costs involved in replacing a failing beam in this situation and was apprised of how grateful the builder would be if I "came to the party".

The first step involved a string line, a step ladder and a tape measure. Sure enough, the beam looked to be deflecting about 15mm.

■ At the GLTAA dinner in Brisbane in April.

■ Professor Bob Milner in full flight at the GLTAA meeting.



■ Graph representing a 600m Radius Camber relevant to certain lengths.

The possibilities included a) an incorrect size had been specified given the loads that were to be applied. Engineers had ruled that out, beam capacity in theory was fine. b) something went very wrong in manufacturing with the timber selected or during adhesive application. However, the checks against our production records had already been done and I was confident manufacturing was not the issue. An inspection of the glue lines and laminates confirmed this. This only left one other obvious possibility c) The beam had been installed upside down... a somewhat a difficult possibility to raise in the presence a very defensive carpenter and his two supervisors.

Sceptical

We were all assured that the beam had been installed correctly. Although the sticker could not now be seen or accessed, the carpenter declared that it was certainly on the beam, and furthermore he had sighted the beam through and installed it 'hump up'.

I'll admit I was sceptical. If the beam had been installed correctly and was now deflecting 15mm, it would mean the load applied had moved the beam 25mm! Time to get everyone out of the house!

One of the ends of the beam remained accessible, but it had been neatly cut. I asked if the beam offcut was available. The length supplied versus the length installed indicated a healthy 500mm offcut should be lying around somewhere. It was - in the builder's car! He had already snagged it; "to make a chopping block for the wife".

Justification

Oh but I really wanted to see this "chopping block"! It was retrieved and to

The 5 safety steps to take when a supervisor is absent

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A supervisor plays a crucial role in maintaining workplace health and safety (WHS) standards as well as minimising the risk of hazards in the workplace. However, what should you do when your designated supervisor is absent? And furthermore, is your business legally vulnerable?

From a WHS point of view - supervision does not mean the constant surveillance of your workers' work activities. It means general direction, coordination and oversight. However, you should also consider any other legislation that may require more levels of supervision. For example the NSW Apprenticeship and Traineeship Act requires constant supervision and instruction. .

Absence is no excuse for a lack of supervision.

A PCBU's overriding obligation is to ensure adequate supervision for work that may pose risks to your workers.

It is no excuse to say your supervisor was away (if an incident occurs). You are expected to make arrangements to deal with foreseeable events such as that.

Business should consider the following five steps when faced with a supervisors absence.

Step 1: Determine the expected duration of the supervisor's absence

If the supervisor is only likely to be away for a short period (e.g. a day or two), you may have more options to cover the absence. If the supervisor will be absent for an extended period (e.g. a week or more), you may need to consider hiring a replacement on a temporary basis.

Step 2: Determine whether the absence of supervision could lead to an increased risk to workers' health and safety

The amount and type of supervision you need to provide depends on the level of risk associated with the job, and the skills, knowledge and experience of your workforce.

Riskier work will require greater supervision, and it may be safer to cease the work for the duration of the supervisor's absence.

Step 3: If the absence will increase the risk, how much and what type of supervision is required to ensure the best safety outcome?

You will need to consider whether an appropriate person in your workplace can replace the supervisor in their absence.

Often a more senior worker in the area will be able to 'step up' to fill in the role for a short period. If no suitable replacement is available, consider bringing a temporary supervisor into the business.

Step 4: Determine whether it is reasonably practicable to provide that level of supervision

It will be reasonably practicable to bring in a temporary supervisor so long as the cost of supervision is not grossly disproportionate to the level of risk in the work being performed.

If there is a workplace incident, these are the types of questions that the safety regulator will focus on when it considers whether sufficient supervision was provided.

Step 5: Determine whether the work can be rearranged or reallocated to minimise the requirement for supervision

If it is not reasonably practicable to provide the required supervision for the task, you must consider whether you can:

cease the work; or

reorganise to ensure the risky tasks are not performed without supervision.

As an example we use fictitious company ABCDE Manufacturing to illustrate how to put these steps in place:

This company has three departments and one supervisor per department. One supervisor is sick and will miss 1 to 2 days of work. While the other two supervisors are able to check in periodically on the sick supervisor's department, this is not enough supervision for some of the tasks performed. So, the department of the sick supervisor is instructed to leave those tasks that have an increased risk until the supervisor returns and to only perform the 'safe tasks' that have been identified.

For particular advice on issues of Workplace Health and Safety, members of TABMA can contact the WH&S and IR Line by calling 1800 822 621. For non-members wishing to find out how to access this service and our other services please visit our website www.tabma.com.au or call TABMA on 02 9277 3100.

my delight, whilst one end had been cleanly cut with a power saw, the other end was untouched and still had hardened glue on the end from the factory floor. Manoeuvring the offcut in position, it was able to be lined up exactly with the end of the beam in situ - laminate for laminate, grain to grain, knot to knot… a perfect match.

Gravity did the rest. Our presses are configured vertically, meaning that when a beam is laid up laminate by laminate in the press, the laminates bow over the camber stick forming the gradual 600m radial arc. This also means that as the required pressure is slowly applied, a certain amount of glue is squeezed out and beads run down the end grain coagulating into goblets of glue which harden in position.

A group of us stood back. The glue runs told the story. Either gravity had been defied in my factory that day and I could now expect the men in black to swoop in or… the beam had indeed been installed upside down and the topside sticker surreptitiously removed after the fact. It was a sweet moment… I ducked outside "to make a phone call" leaving the carpenter to discuss with his supervisors the new reality of the situation which no longer needed to involve the manufacturer.

So, look out for those 'topside stickers' or ink patterns! Manufacturers under the GLTAA's quality accreditation scheme will also have the GLTAA logo clearly marked on the topside of the beam providing extra reassurance.

■ Glue runs on ends of beams from factory.