



Case Study

Commercial Projects: Floor Joists



Just The Facts:

Builder:

Paynter Dixon: +61 2 9797 5584

Structural Engineer:

Pryda: +61 3 9706 5488

Fabricator:

Bunnings Warnavale: +61 2 4392 2441

Steel Supplier:

Smorgon Steel: +61 2 9749 3000

Other:

Hudson Frame and Truss: +61 2 8870 4600

Built: New

Usage: Nursing home second storey floor

LSB sections used: 7.2 metre single span joists
 300 × 75 × 3.0 LSB @ 450 c/c (104 kg)

Type of Construction: Brick and timber

Current Progress: In progress

Firm flooring solution found with LSB™

One challenge presented by commercial construction projects is selecting efficient floor joists capable of carrying heavy floor loads across a long span – and how to install them economically on-site.

Builders Paynter Dixon found a solution to their problem when constructing this second storey floor of a nursing home in Sydney currently under construction.

The nursing home floor required a combined loading of about 5 kPa with 450 mm spacing between joists and a total span of 7.2 metres.

After considering engineered timber beams, including Hyspan (LVL and C-section purlins), Paynter Dixon chose LiteSteel™ beam (LSB) for its unbeatable value, and clear span performance.

Using Hyspan timber joists would have required two 3.6 m joists at 450 c/c with an additional 310 UB at the mid-span to meet the 7.2 m span to retain 450 mm joist spacing.

Only LSB's floor joist system could achieve the 7.2 metre span in single joists with better structural performance in load carrying capacity, bending moment and deflection over long spans. LSB's longer spans can achieve up to a 7.2 kPa floor load.

When specifying the job, less metres of material was required since with LSB, larger spacing is possible between joists. LSB also delivered less depth of member compared to alternative products.

In terms of cost, LSB proved more competitive for spans greater than four metres.

LSB offered timber-like workability with the added benefits of being straighter, no termite susceptibility and requiring no bridging, and less supporting posts and excavation.

Over 100 metres of LSB was used in the floor, including 7.2 metre single span joists of 300 × 75 × 3.0 LSB at 450 c/c.





When it came to installing the floor joists, LSB continued to achieve real time and cost savings due to its light weight and ease of manoeuvrability on-site.

The high strength to weight ratio of LSB means it is easier to handle on sites with difficult access, and achieves savings by either requiring a smaller crane on-site – or no crane at all.

Controlling work schedules on commercial construction sites is all important. LSB proved easy to install with no welded connections, and no delays in off-site fabrication.

LSB delivered better availability, with less than 48 hours delivery compared to timber beams that can have a wait of up to six weeks.

With the ability to be cut, nailed, screwed and drilled on-site using professional power tools, LSB offered on-site flexibility – which is important in an environment where time literally is money.

A standard professional hand-held circular saw fitted with a ferrous metal cutting blade makes cutting LSB on-site as easy as cutting timber.

Similarly, using a professional hand-held power drill, site workers can easily drill through structural steel beams, making it easy to attach brackets, bolts and other components.

Cutting service holes into LSB on-site is simple using a standard power pack drill fitted with a carbide tipped hole cutter. This can be done after the beams have been installed so services can be passed through exactly where they need to be – an advantage not available with Hot Rolled Steel structural beams.

Using a pneumatic nail gun, workers are able to nail flooring (up to 22 mm thick) directly to LSB.

Previously, connecting steel sections to other parts of a building structure was only possible through welding.

However, connecting LSB is convenient and efficient – readily available galvanised steel brackets, such as 'Pryda' brackets for structural timber, can be used.

Alternatively, if required, LSB is easy to weld using Manual Metal, Gas Metal or Flux Cored Arc Welding.

The LSB sections arrived on-site pre-primed and ready for painting once installed. The environmentally-friendly EnviroKote™ water-based primer paint protective coating system applied to LSB during manufacturing provides more durability, scratch resistance and up to twice the level of corrosion protection of traditional steel tube primers.

The advantages of using LSB as floor joists can be easily applied to similar commercial construction contexts, including office or storage floors in warehouses, retail storage systems, roof beams in sporting clubs, boat storage systems and temporary floor systems.

As this project demonstrates, when it comes to long spans and heavy floor loads, an LSB floor joist system outperforms other products on the market, and achieves real time and cost savings.



Call us. Fax us. Email us. Visit us.

For further product information or technical support on LSB from Smorgon Steel, email lsb@smorgonsteel.com.au or call **1300 789 572**.

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MAY 2006