Review

The breadth of technical data, design details and worked examples in this practical guide to structural insulated panels will fill a gap in an engineer's technical library, believes James Norman.

Structurally Insulated Panels Design: Structural Design Manual

Author: Hugh Morrison
Publisher: Hugh Morrison Associates
Price: £44.99
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BACK WHEN I WAS WORKING IN INDUSTRY, around 2010, there was much discussion around the use of structural insulated panels (SIPs)**.** Their potential for providing efficient, low-carbon solutions was much debated. And then everything seemed to go quiet. That is until a few weeks ago, when I heard a podcast on SIPs made from recycled plastic bottles and hemp shiv boarding, and received *Structurally Insulated Panels Design* through the post to review. It turns out SIPs have continued to be used, mostly on smaller domestic projects and garden offices, but also in other applications.

The book by Hugh Morrison covers everything I think a designer could want: breadth of technical data; exhaustive design details and calculations; worked examples. It really can't be faulted. SIPs are a composite and, as such, can't be designed simply to Eurocode 5, instead relying on a more nuanced consideration. One surprise for me was how much influence the shear deflection of the panels has on the overall performance. The author also highlights many of the challenges, predominantly using limit state design, but reverting to permissible stress for racking panels – hopefully something that will be resolved with the next generation of Eurocodes.

Personally, there were only a few places where I wanted more. One was around fire – where the author assumes fire board will provide adequate protection – but I am left wondering what the impact of elevated temperatures is on the composite action of the material (does the insulation shear stiffness significantly decrease or do the OSB panels de-bond?), which is an area for research I suspect rather than an area the author has neglected.

The second was around design of connections, where continuity of moment is assumed in panels – there are really helpful connection details for a number of standard scenarios, but no worked example for a connection between panels.

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Finally, a more critical review of the insulation material, its current sourcing and impact, and future potential. Straw is mentioned as a possible alternative in the introduction, but no examples are provided, leaving the engineer to wonder whether it is possible.

None of this should take away from the breadth and depth of the information that is generously provided by the author. They clearly have much experience and have tried to pour it into this practical guide, which fills a gap in an engineer's technical library.



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James Norman is an award-winning engineer and teacher. He has designed landmark buildings and developed innovative teaching that combines practice with learning. He has written several books for engineers and students, including the IStructE's latest thought-leadership title, *The future of structural design*. The combination of his teaching, research and practice is changing approaches to sustainable building design across industry.