

**Channel fabrications**

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Steel-framed buildings are frequently built with floor slabs using profiled metal decking. These may be trapezoidal (eg Ribdeck, Multideck) or re-entrant (eg Holorib).



Trapezoidal decking

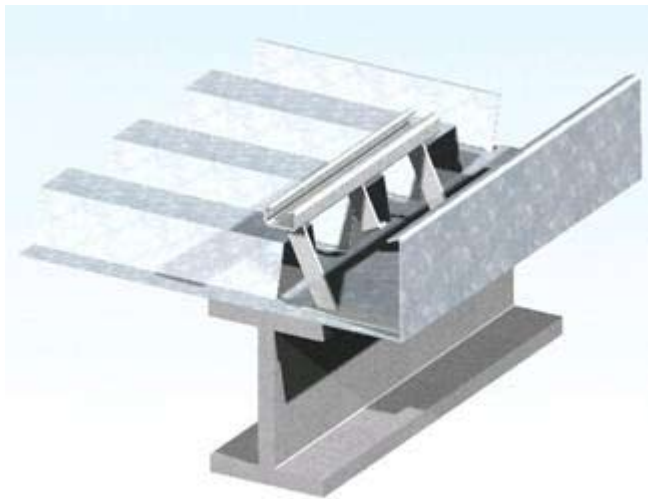


Re-entrant decking

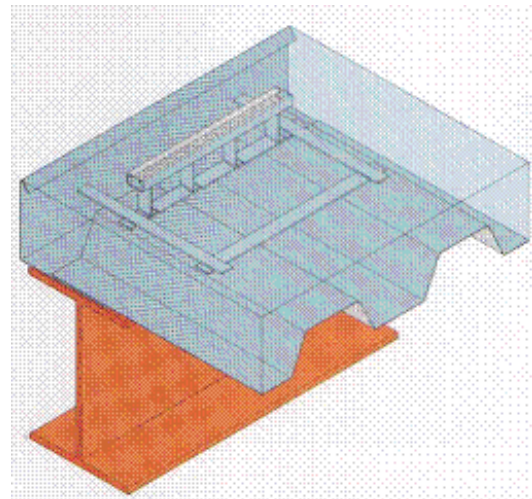
In either case there were, until recently, considerable difficulties in achieving a secure restraint fixing into the top of such slabs. It is not uncommon for the slab depth over the ribs to be in the order of 70mm. This precludes the use of standard sockets, which are typically 75mm or more in length. Similarly, 'standard' channel including the retaining anchors is frequently in excess of 70mm deep. It is not possible to state that the anchor must always be in the 'deep' section between ribs, since this is subject to site conditions and cannot be relied on. In addition, such slabs are only lightly reinforced, and there is a risk of sideways failure in the case of a cast-in socket near to the slab edge.

To overcome this problem, there are now purpose-made channel assemblies available, made specifically for use with decking slabs. J&P's system is called a 'sled' and Halfen's is known as a 'ski'.

They both consist of normal channel section but with additional straps welded on. When the top of the channel is flush with the top of the concrete, then the straps sit on the decking and are pinned to it. This means that no top locations are needed as is the case with sockets or standard channel.



J&P sled



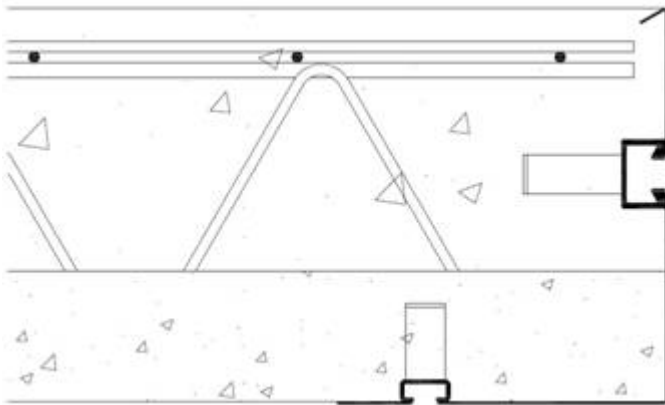
Halfen Ski

Both systems will take horizontal loads of up to 20 kN or more, depending on the configuration. This is normally more than adequate for a cladding restraint fixing. Both manufacturers will provide CAD and sketches for a given situation.

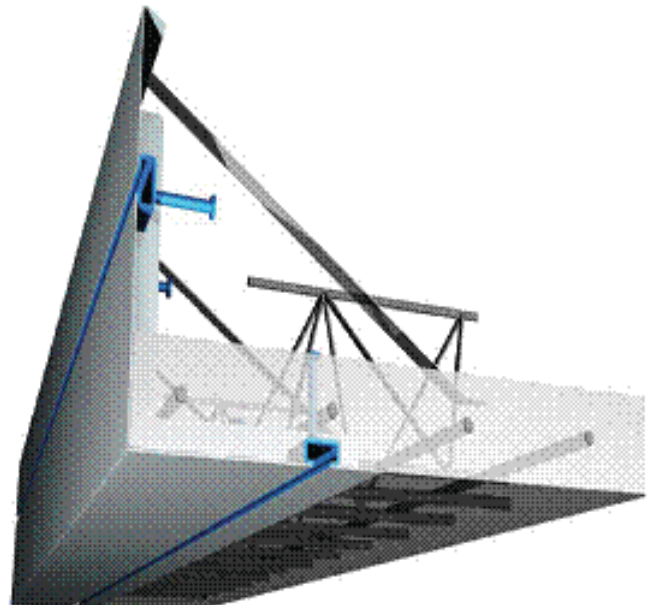
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Precast floor slabs such as Omnia and other elements with lattice reinforcement are used with a structural concrete topping. At the slab edge, this needs an edge shutter, and there is often a requirement to incorporate cast-in channels into the edge as well. One way of achieving this is to incorporate the channel into an edge shutter, which is incorporated into the precast during manufacture. This is often the best way to provide a channel either for restraining cladding, or attaching a brick support angle.



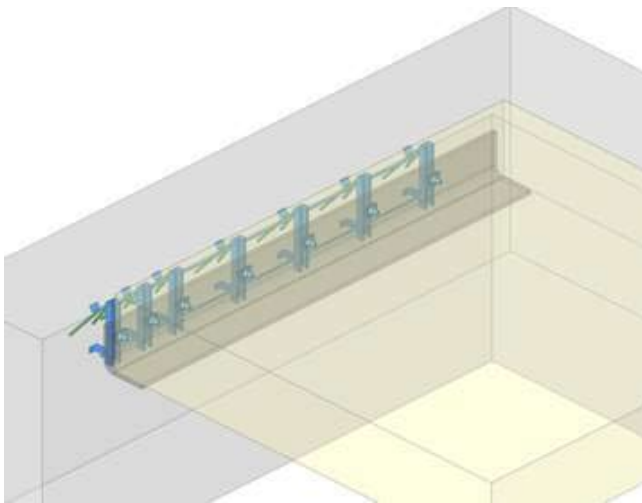
The precast arrives on site with the edge trim and channel already incorporated. By incorporating the shutter and the channels into the precast, several site operations are done away with. This also removes the need for any site scaffolding, or working outside the slab edge.



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Precast stairs and landings are frequently supported on angles. These angles are in turn fixed to the stairwell wall, which itself may be precast or insitu. The fixings for the angles can be post-applied, such as drilled-in expansion or resin fixings. However, it is normally necessary to use a template, such as the angle itself when doing this, and the process is time consuming and may take costly 'hook time' on the crane. A far better method is to use a cast-in fixing such as a socket or channel, and of these, the channel solution gives the greatest tolerance.



To facilitate the work of casting in the channels, they are normally prefabricated into a 'ladder'. The channels used are the toothed type, and this gives vertical tolerance. By forming horizontal slots in the angle, then considerable adjustment can be carried out so that the landing is at the correct height.

In addition, the layout of the channels can be adjusted along the ladder. For example, the spacing can be reduced at one end if the landing is supporting a stair flight and hence taking increased loading.

In addition, additional reinforcement can be incorporated onto the channel anchors to give increased capacity, especially if the stairwell wall is thin. As the fabrication is bespoke, then the reinforcement can be positioned to give optimum performance.

Suppliers of channel ladders will normally carry out the design and supply calculations. An alternative to a bolted-on angle is to use a proprietary cast-in insert in the precast landing. These project from the landing into a recess in the stairwell wall. There are different varieties of these inserts available (see elsewhere).

