

5. DESIGN CONSIDERATIONS



Important factors to be considered during the early stages of design.

The Product Information and Technical Specifications in this brochure are based on the following Design Assumptions:

- wHOLE.**Protect** GRP to be supported on 4 sides and act as 2 way spanning with maximum ratio 2:1, based on a maximum span of 1200mm in any one direction. Where the opening is greater than 1200mm, intermediate support is to be provided to the wHOLE.**Protect** GRP panel in accordance with FibreGrid™ and wHOLE.**Protect** literature.
- Standard edge trim restrained at 600mm c/c with restraint straps as per TATA requirements. Note the design of these straps is outside the scope of these calculations.
- Maximum unsupported slab edge cantilever distances are in accordance with TATA ComFlor manual and wHOLE.**Protect** typical details.
- Grating acts as fall protection system installed with the composite floor deck at each level as works progress. Worst case assumption is for a person to fall on to the wHOLE.**Protect** GRP from the level above prior to the upper wHOLE.**Protect** GRP being in place.
- Global short-term serviceability of the section is not critical as the grating and edge trim is supported along its entire length by the primary steelwork. The trim provides temporary fall protection and will also be restrained by the concrete slab in the permanent condition, therefore edge trim to be checked for plastic failure capacity only. However, the local serviceability of the cross sections is to be determined within the analysis for comparison of site testing.
- Material strength S280 N/mm² galvanised steel.
- Section not subject to axial compression or torsional forces.
- Temporary load duration is 'very short-term'.



YOUR QUESTIONS ANSWERED

? CAN I RUN SERVICES THROUGH THE WHOLE.PROTECT SYSTEM?

Yes. For small pipes and cables, these can potentially run through the wHOLE.**Protect** Standard (WP04SD) or wHOLE.**Protect** Micro (WP11MC) grating. However, the wHOLE.**Protect** GRP can be easily modified on site to accommodate larger services. Give us a call early and we can review each requirement specifically.

? NO GAPS - IS IT POSSIBLE TO FULLY CLOSE THE VOID?

Yes. Our wHOLE.**Protect** Solid (WP04ST) system provides complete peace of mind, offering a solid-top finish ensuring no items can pass through.

? CAN THE SIZE OF THE VOID BE MAINTAINED?

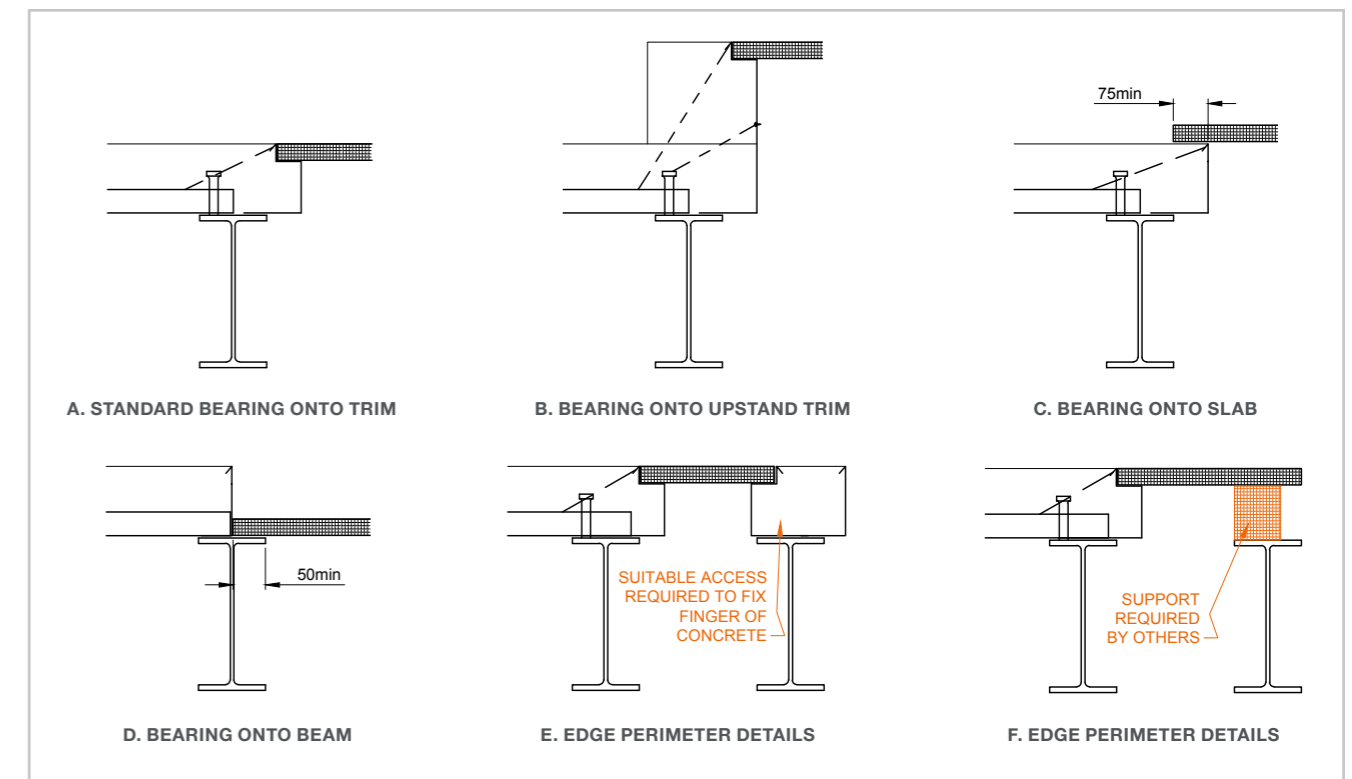
Yes, however...

- The beam size will determine the setting out of the steelwork.
- The trimming steelworks may need to be adapted to suit the specific scenario.
- Material must not be overlapped. Minimum beam width of 100mm required to avoid overlapping of material.

? WHAT'S THE LARGEST VOID I CAN COVER USING THE WHOLE.PROTECT SYSTEM?

For our standard wHOLE.**Protect** (WP04SD) the maximum void width is 1200 mm although we can accommodate almost any length. Should your void be larger than this, give us a call early and we can guide you through the options.

? WHICH DESIGN SCENARIO / BEARING DO YOU REQUIRE?



? WILL WHOLE.PROTECT CREATE A TRIP HAZARD?

No. Our CAD design team detail different bearing scenarios to ensure that wHOLE.Protect is installed as flush to the concrete slab as possible eliminating trip hazards. Call us to discuss your bearing requirement.

? WILL THE SYSTEM WORK WITH THRU-DECK SHEAR STUDS ON THE ADJACENT BEAMS?

Yes. The wHOLE.Protect system can accommodate shear studs to the beams trimming the void, although this is dependent on the size of beam and location of the slab. It might be that the beam needs to be moved to maintain void size and accommodate shear studs. Please see diagrams below or give us a call and we'll guide you through the options.

? CAN I USE WHOLE.PROTECT SYSTEM WITH STRUCTURAL ROOF DECKING AS WELL AS FLOOR DECKING?

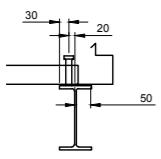
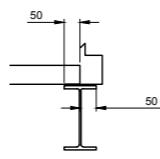
Yes. Although more commonly used with floor decking, we have successfully installed wHOLE.Protect on a range of roof decking projects. The grating can be supported either directly on the structural steelwork, directly onto the deck or on a specially adapted flashing.

? WHAT IS THE MAXIMUM LOAD THE GRP CAN TAKE?

The maximum load varies depending on the wHOLE.Protect product specified and when and how it is to be used e.g. whether in its Temporary state (i.e. when we install it) or in its Permanent state (i.e. when the concrete is cast). It's best to give us a call to discuss the conditions of use. See load tables on page 10.

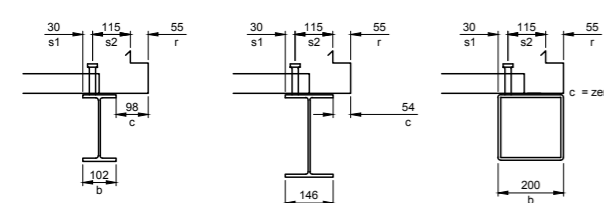
**WHOLE.PROTECT
MINIMUM BEAM SIZES AND STEEL SETTING OUT**

Q: ARE SHEAR STUDS REQUIRED?
Minimum beam width of 102mm required depending on void size and slab cantilever

STUD REQUIRED

SETTING OUT OF TRIMMING STEEL TO SUIT VOID SIZE



FOR BEAMS WITH STUDS

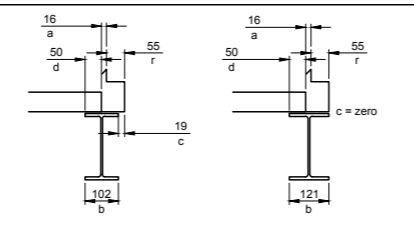
TO CALCULATE SETTING OUT FOR TRIMMING STEELS, THE FOLLOWING FORMULAE CAN BE USED.

$s1 + s2 + r - b = c$

- ➔ Minimum beam width required is 102mm, however a cantilever of 98mm is required.
- ➔ Maximum beam width to achieve edge of beam slab/trim is 200mm.
- ➔ For beams over 200mm, studs can move inbound.
- ➔ A minimum bearing of 50mm is required for both deck & edge trim. The edge trim requires a 50mm projection past the recess, resulting in a minimum bottom leg of 125mm.

NO STUDS REQUIRED

SETTING OUT OF TRIMMING STEEL TO SUIT VOID SIZE



FOR BEAMS WITH STUDS

TO CALCULATE SETTING OUT FOR TRIMMING STEELS, THE FOLLOWING FORMULAE CAN BE USED.

$d + a + r - b = c$

- ➔ Minimum beam width required is 102mm, however a cantilever of 19mm is required.
- ➔ Maximum beam width to achieve edge of beam slab/trim is 121mm.
- ➔ For beams over 121mm, deck bearing will increase
- ➔ A minimum bearing of 50mm is required for both deck & edge trim. The edge trim requires a 50mm projection past the recess, resulting in a minimum bottom leg of 125mm.

LEGEND

CONSTANTS

- a - Deck Edge to edge trim.
- d - Deck Bearing = min 50mm
- r - Recess in edge trim for grate bearing - 55mm
- s1 - Edge of beam to stud centreline = 30mm
- s2 - Stud centreline to edge trim = 115mm (to achieve full composite action)

VARIABLES

- b - Width of Beam
- c - Cantilever of edge trim from edge

To ensure the smooth installation of wHOLE.Protect, coordination is required during the deck design phase.

Early engagement with the Composite Profiles team is key.

Talk to us and we can advise **01202 659 237**
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