Promat Structural Steel Encasement interfaces with non-loadbearing Remagin SFS THRUWALL® Systems

Introduction

SFS systems use thicker steel framing than light-weight drywall systems. They can be used to provide a loadbearing function, or as a non-loadbearing infill within a structural steel frame for external walls. Whilst technically these are "non-loadbearing" and won't perform a full structural function, they must resist wind pressure and cladding loads.

Remagin are a division of Etex Building Performance Limited who specialise in light-weight SFS constructions. Promat have worked with Remagin to provide interface solutions for use with their non-loadbearing SFS infill solutions, called the THRUWALL® system, which consists of Remagin SFS framing with Siniat boarding. These details are specifically for Remagin systems, and cannot be used with another manufacturer's systems.

As these infills are usually located within external walls, we do not recommend the use of PROMATECT®-250 for structural steelwork protection in these locations. We recommend using PROMATECT®-XW or VERMICULUX®-S structural steel encasement boards.

Fig 1.1 – Testing rig set up with thermocouples in place prior to placement into fire testing furnace.

Structural engineers at Remagin performed a testing programme, using 3rd party laboratories to verify the capacity and load response of fixings to the head track of the SFS THRUWALL® system through the Promat Structural Steelwork encasement boards at the interface. Testing involved placing the fixings under a cyclic shear load to simulate wind loading acting on the junction. The results of these tests verify the mechanical capabilities and responses of fixings under the assessed scenarios.

The two bespoke fire tests carried out by the technical development team demonstrate that 60 minutes fire integrity and insulation were achieved at the interface between the fire protection boarded encasement and the light gauge steel framing. This test data has been used to develop three interface details.

The first detail is a direct fix of the SFS system under the steel through the structural steel encasement boards; the second, a direct fix using Z-bars (i.e. allows inclusion of cover strips); and the third is an offset interface using Z-bars inside the encasement to provide bearing for the SFS TEK fixings.

It is critical to ensure that the specifier is made aware these recommendations are based on a bespoke fire test method because there is no designated standard for interfaces.

The authority to proceed on the basis of these details is always the responsibility of the Principal Designer.

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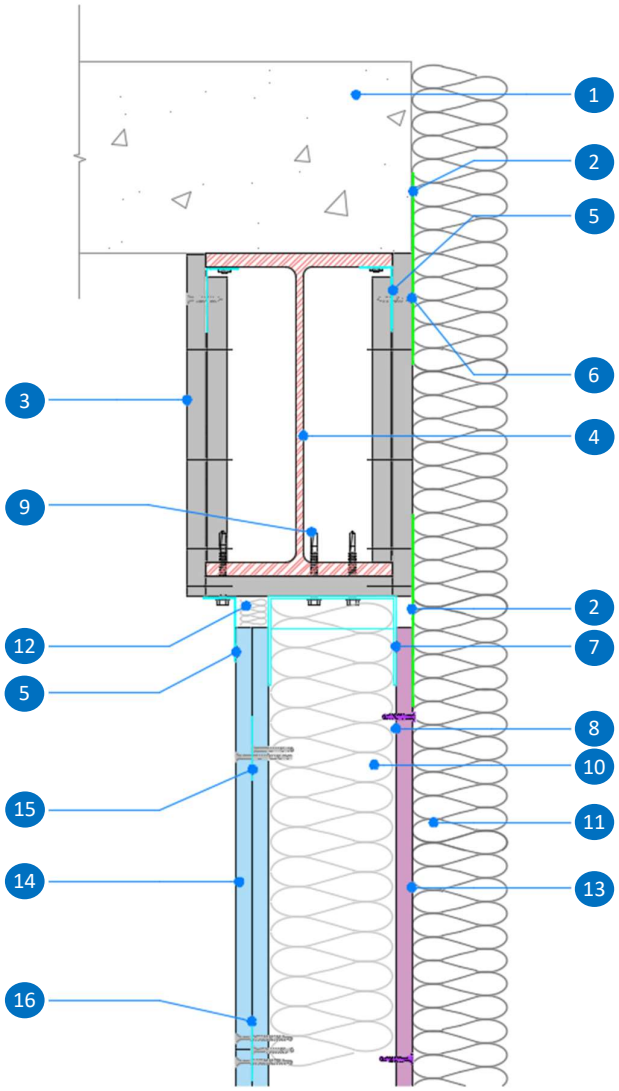
Encasement interfaces between beams protected with Promat PROMATECT®-XW and infilled with SFS THRUWALL® systems for up to 60 minutes fire resistance through the elevation

The section detail illustrates the interface between a Promat PROMATECT®-XW encasement and a THRUWALL® SFS system with deflection head detail. The system is specific to the Remagin SFS framing, and Remagin must review the design and specify the fixings (type and number) for each project.



KEY

1	Concrete/Composite Floor	9	SFS (TEK) fixings designed specifically for the project by Remagin
2	Proprietary air/weather seal tape or similar (by others)	10	100mm full fill Stone Mineral Wool as per THRUWALL® specification
3	Promat PROMATECT®-XW Structural Steel Encasement System	11	Minimum 50mm Stone Mineral Wool
4	Universal Beam as per Structural Engineers design	12	Stone Mineral Wool
5	Siniat MFC2550 Angle	13	12.5mm Siniat Weather Defence™ Board as per THRUWALL® Specification
6	Siniat Self Tapping Screws - M3.5 x 32mm at maximum 300mm centres	14	Siniat Internal Board(s) as per THRUWALL® specification
7	Remagin Slotted Head Track (2.0mm)	15	Siniat metal flat strap at highest fixing points
8	Remagin SFS Studs	16	Siniat metal flat strap at horizontal joints

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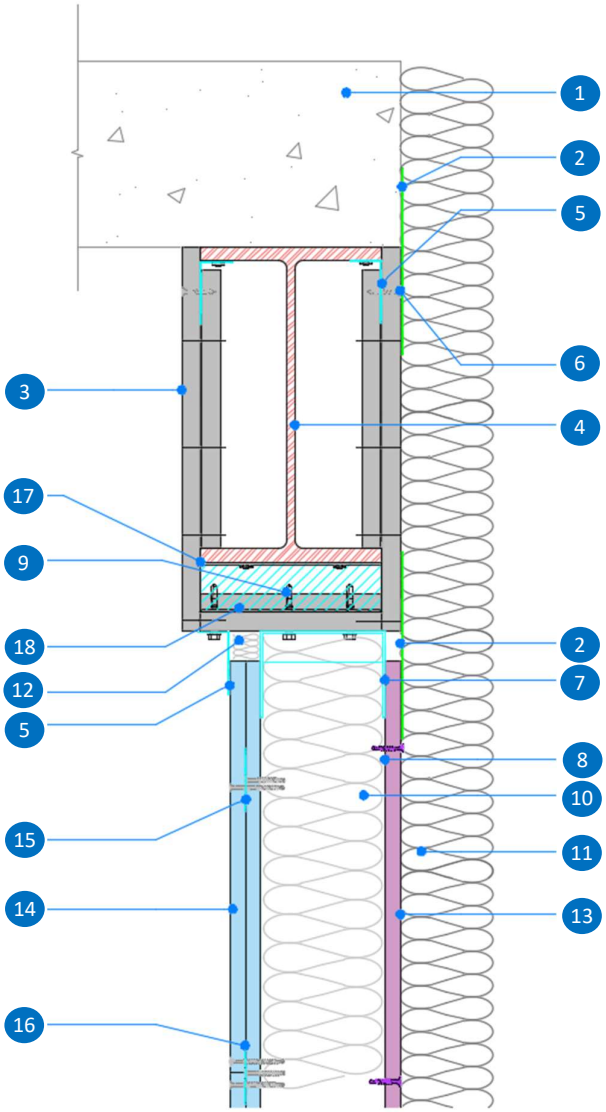
Encasement interfaces between beams protected with Promat PROMATECT®-XW or Promat VERMICULUX®-S and infilled with SFS THRUWALL® systems for up to 60 minutes fire resistance through the elevation

The connection of a THRUWALL® SFS System into a Promat steel beam encasement, including Z-bars below the flange, requires a different approach.

Remagin have developed a detail using Z-bars of a minimum 2.5mm thick, shot-fired or screwed to the underside of the bottom flange of the beam. This is a suitable solution for single layer encasements, where a maximum of up to 25mm thick board is fixed to the underside of the Z-bar to form the encasement. This approach allows any coverstrips required as part of the encasement to be installed within the Z-bar zone.

All projects are designed on a case-by-case basis. Please consult Remagin directly with queries. The system is specific to the Remagin SFS framing, and they must specify the Z-bar thickness, centres, and fixings for each project.



KEY

1	Concrete/Composite Floor	10	100mm full fill Stone Mineral Wool as per THRUWALL® specification
2	Proprietary air/weather seal tape or similar (by others)	11	Minimum 50mm Stone Mineral Wool
3	Promat Structural Steel Encasement System	12	Stone Mineral Wool
4	Universal Beam as per Structural Engineers design	13	12.5mm Siniat Weather Defence™ Board as per THRUWALL® Specification
5	Siniat MFC2550 Angle	14	Siniat Internal Board(s) as per THRUWALL® Specification
6	Siniat Self Tapping Screws at 200mm centres, screw length to give minimum 10mm penetration into angle	15	Siniat metal flat strap at highest fixing points
7	Remagin SFS Slotted Head Track (2.0mm)	16	Siniat metal flat strap at horizontal joints
8	Remagin SFS Studs	17	Suitable Z-bar (min 2.5mm) designed by Remagin as per SFS design.
9	SFS (TEK) fixings designed specifically for the project by Remagin	18	Promat Structural Steel Encasement System Coverstrip

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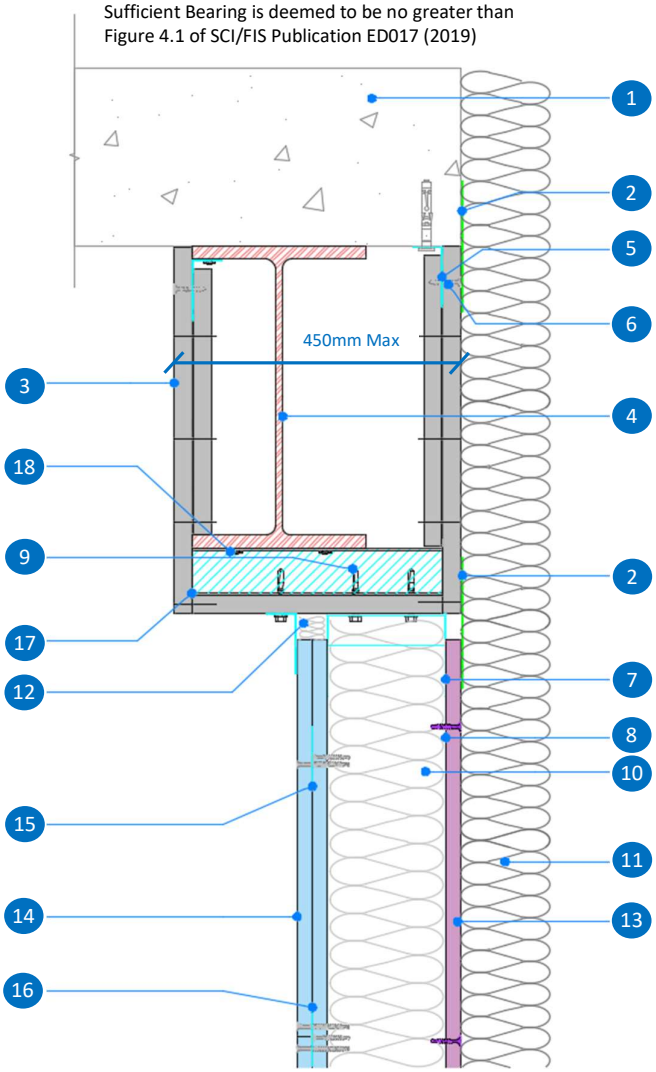
Encasement interfaces between beams protected with Promat offset structural steel encasements and infilled with SFS THRUWALL® systems for up to 60 minutes fire resistance through the elevation

A 60 minute fire resistance test (integrity and insulation) was successfully performed on an offset interface using Z-bars inside the encasement.

Based on the results of the bespoke test, and to comply with the requirements of BS EN 13381-4, the maximum offset is 50mm. However, an in-house technical evaluation of the detail has been completed, and Etex Building Performance Limited will support a maximum size of the encasement with Z-bars for a total width (including the thickness of the encasement boards) of 450mm for PROMATECT®-XW, and VERMICULUX®-S.

Remagin shall design and specify the Z-bar to suit the project requirements, authority to proceed on the basis of this bespoke testing is always the responsibility of the Principal Designer.

Sufficient Bearing is deemed to be no greater than Figure 4.1 of SCI/FIS Publication ED017 (2019)



KEY

1	Concrete/Composite Floor	10	100mm full fill Stone Mineral Wool as per THRUWALL® specification
2	Proprietary air/weather seal tape or similar (by others)	11	Minimum 50mm Stone Mineral Wool
3	Promat Structural Steel Encasement System	12	Stone Mineral Wool
4	Universal Beam as per Structural Engineers design	13	12.5mm Siniat Weather Defence™ Board as per THRUWALL® Specification
5	Siniat MFC2550 Angle	14	Siniat Internal Board(s) as per THRUWALL® Specification
6	Siniat Self Tapping Screws at 200mm centres, screw length to give minimum 10mm penetration into angle	15	Siniat metal flat strap at highest fixing points
7	Remagin SFS Slotted Head Track (2.0mm)	16	Siniat metal flat strap at horizontal joints
8	Remagin SFS Studs	17	Suitable Z-bar (min 2.5mm) designed by Remagin as per SFS design (max width = 450mm)
9	SFS (TEK) fixings designed specifically for the project by Remagin	18	Shot-fire or Tek screw fixings

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